

# Appendix B: Pump Station Final Condition Assessment Report

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## List of Abbreviations

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AC	Asbestos Cement
BFE	Base Flood Elevation
BEP	Best Efficiency Point
CA	Condition Assessment
CAP	Condition Assessment Program
CCTV	Closed Circuit Television
CI	Cast Iron
CIP	Capital Improvement Program
CMMS	Computerized Maintenance Management System
DEQ	(Virginia) Department of Environmental Quality
DI	Ductile Iron
EPA	(United States) Environmental Protection Agency
EPC	Emergency Pump Connection
ESVC	Extra Strength Vitrified Clay
FM	Force Main
FPR	Flow, Pressure, Rainfall
gpm	gallons per minute
GIS	Geographic Information Systems
HDPE	High Density Polyethylene
I/I	Infiltration/Inflow
MACP	Manhole Assessment and Certification Program
MCC	Motor Control Center
MOM	Management, Operations and Maintenance
N/A	Not applicable
NASSCO	National Association of Sewer Service Companies
NEC	National Electric Code
NOAA	National Oceanic & Atmospheric Administration
PACP	Pipeline Assessment and Certification Program
PCCP	Prestressed Concrete Cylinder Pipe
PE	Polyethylene
PFTs	Peak Flow Thresholds
PRS	Pressure Reducing Station
PS	Pumping Station
PVC	Polyvinyl Chloride
RCP	Reinforced Concrete Pipe
RCCP	Reinforced Concrete Cylinder Pipe
RTS	Regional Technical Standards
RWWMP	Regional Wet Weather Management Plan
SCADA	Supervisory Control and Data Acquisition
SCAT	Sewage Collection and Treatment
SOC	State Order by Consent
SP	Steel Pipe
SSES	Sanitary Sewer Evaluation Survey
SSO	Sanitary Sewer Overflow
SSORS	Sanitary Sewer Overflow Reporting System
TDH	Total Dynamic Head
VC	Vitrified Clay
VFD	Variable Frequency Drive

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## Section 1

# Introduction

This report is an Appendix to HRSD's Rehabilitation Action (Rehab) Plan to satisfy the requirements of the United State's Environmental Protection Agency (EPA) Consent Decree as well as the Virginia Department of Environmental Quality (DEQ) Special Order by Consent (SOC) for reporting on results of the Condition Assessment Program (CAP). This document summarizes condition assessment results related to HRSD's pumping facilities. Appendices A, C, D, and E satisfy the remaining reporting requirements of the CAP. Assets found at material risk of failure, as described further in this report, are addressed in the main document, the Rehab Plan. The primary purpose of the HRSD CAP was to find sanitary sewer assets presenting an actual material risk of failure. For the purposes of this document, "failure" means any condition resulting in a sanitary sewer overflow, pipe leakage, or interruption of service to HRSD's customers, due to a physical condition defect in the system.

The HRSD Sanitary Sewer Evaluation and Survey (SSES) and Condition Assessment Plans identified 81 HRSD pumping facilities to be evaluated. The 81 HRSD pumping facilities consist of 66 wet well pumping stations (PS) and 15 Pressure Reducing Stations (PRS). One of the wet well pumping facilities has the ability to function as both a PS and a PRS but only the PS capability is currently used. Supervisory Control and Data Acquisition (SCADA) assets within the HRSD system are predominantly located at the pumping facilities and were evaluated together with the pumping facilities.

The results of the pump station (PS)/pressure reducing station (PRS) Condition Assessment Program (CAP) are presented within this report. A complete listing of HRSD pumping facilities along with major inspection dates can be found in Table B-5.

### **Pump Station Final Condition Assessment Report Organization**

Section 1 of this report contains the introduction and organization of the report.

Section 2 of this report, Pumping Facility Analysis, describes those condition assessment (CA) activities done by HRSD that consisted of primarily record review and desktop analysis. Summaries of methods and results are documented.

Section 3 of this report, Pumping Facility Inspections, describes those CA activities done by HRSD that consisted of primarily site inspections as well as draw-down testing. Summaries of methods and results are documented.

Section 4 of this report gives details about assets presenting material risk of failure.

Section 5 contains tables that are referred to throughout Sections 1 through 3.

Section 6 of this report summarizes the Pumping Facility Inspections for each facility and is listed in order of the HRSD pumping facility number.

The CAP and SSES plans require summaries of the CA activities to be included in the Pumping Facility Final Condition Assessment Report. Those requirements are listed in Table B-1 which references the applicable sections for each CA activity summary.

<b>Table B-1. PS FCAR Organization</b>	
<b>Requirements:</b>	<b>Applicable Section:</b>
1. A description of each pumping facility	6
2. Information regarding the results of the evaluation of each pumping facility	3.1; 6
3. The results of pump draw-down test performed at each wet well pumping station	3.3; 6
4. Comparison of flow data and upstream Locality Peak Flow Thresholds to existing pumping capacity	2.6; 5
5. Information about the back up power and emergency pumping capability of each pumping facility	2.2; 2.6; 3.3; 5; 6
6. Information regarding lightning strike protection equipment at each pumping facility, where applicable	3.2; 6
7. Descriptions of the history of failures at each pumping facility, including power loss-related and lightning strike-related SSOs during the past 5 years	2.3; 5; 6
8. Information on the evaluation of flooding potential at each pumping facility and description of previous flooding events for the past 5 years, as well as the proposed actions to be taken for those facilities with a history of flooding	2.1
9. Information on the SCADA systems at each pumping facility and their ability to fulfill the designed functions	2.4; 5
10. Details on how the existing facility equipment compares to Virginia Sewage Collection and Treatment (SCAT) Regulations	2.5; 5
11. Identification of pumping station components that present an actual material risk of failure	4

## Section 2

# Pumping Facility Analysis

For those pumping facility assessments which did not require extensive field inspections, HRSD performed analysis using existing records and various available data. The methods and results of these activities are described within this section.

## 2.1 Flooding Potential and History of Flooding

As part of the CAP and SSES Plans, HRSD is required to provide information on the evaluation of flooding potential at each pumping facility and description of previous flooding events for the past 5 years, as well as the proposed actions to be taken for those facilities with a history of flooding.

To evaluate the flooding potential and history of flooding at the HRSD pumping facilities, HRSD performed the following tasks:

- HRSD Operations staff was interviewed to determine if there were known flooding problem locations;
- Previous hurricane / flooding related studies were reviewed;
- Pumping facility bench mark elevation information from previous survey work was gathered and reviewed;
- Historical tide data since September 26, 2002, was obtained from the National Oceanic and Atmospheric Administration (NOAA); and
- A comparison table of pump station elevations versus historical tide data was prepared.

### 2.1.1 History of Flooding

HRSD Operations staff reported that flooding normally affects the collection system more directly than the pumping facilities. Flooding contributes inflow and infiltration (I&I) which can lead to capacity challenges. As an example, on August 25, 2012, HRSD's Center Ave PS service area as well as service areas throughout HRSD's North Shore system experienced flash flooding as a result of a significant rain event. The pumping station continued to operate; however, a significant portion of the collection system was submerged leading to a sanitary sewer overflow (SSO). Flooding records showed that there are three other pump stations which have sustained damage to critical equipment during severe and extreme wet weather events. Those stations are listed in Table B-2.

**Table B-2. Pumping Facilities with Documented Flooding Damage**

HRSD PS Number	HRSD PS Name	Date	Event Description
109	Dozier's Corner	November 2009	Nor'easter
124	Richmond Crescent	November 2009	Nor'easter
114	Monroe Place	September 2003	Hurricane Isabelle

### 2.1.2 Flooding Potential

To establish whether or not a pumping facility has flooding potential, HRSD compared historic tide data from local NOAA tide stations to the pumping facility elevations with reference to the geodetic datum NAVD88. The elevation at which equipment damage may occur was used to compare each pumping facility to the tide data. HRSD considered potential flooding events of less than or equal to one hour and less than or equal to 0.1 ft to be insignificant and unlikely to be a threat to the critical equipment at a pumping facility. Stations with significant flooding events were considered to have flooding potential and were further analyzed for existing flooding protection measures.

### 2.1.3 Flooding Vulnerability

As a result of the history of flooding and flooding potential analysis, HRSD determined that the following stations were vulnerable to flooding damage:

- Ashland Circle
- Monroe Place
- Dozier's Corner
- Ferebee Ave
- Washington District
- Richmond Crescent

Additionally, Granby St, Hanover Ave, and Jamestown Crescent have submersible pumps and may be subject to flooding without equipment damage.

These stations can be found in Table B-10. Pumping Facility Assets that Present Material Risk of Failure for addressing activities which will mitigate the flooding vulnerability.

## 2.2 Dual-Feed Power Assessment

HRSD utilizes various methods for redundancy in supplying power to its pumping facilities. These methods include diesel-driven pumps, back-up generators and dual-feed power supply. HRSD has nine pump stations which utilize dual-feed power that are listed below.

North Shore:

- Bloxoms Corner
- Hampton University
- Langley Circle

South Shore:

- Arctic Ave
- Cedar Lane
- Dovercourt Rd
- Norchester St
- Taussig Blvd
- Washington District

To assess the dual-feed systems, HRSD performed the following activities:

- Documented the level of redundancy of the power legs with information provided by the local utility;
- Reviewed pump station SCADA and SSO records to determine where dual-feed power failure has occurred;



- Interviewed Operations staff to identify known problem locations; and
- Observed the automatic transfer switches during the pump station facility inspections.

This information is documented in Table B-3 and Section 6 for each applicable pump station.

Information regarding the specific substations that supply dual-feed power pump stations is confidential and was not available from the local power utility; however, the utility provided information regarding the level of redundancy in the transmission infrastructure from the substation to the PS. This information is shown in Figure B-1 at the end of Section 2.5 Pumping Facility Comparison to Virginia SCAT Regulations.

## 2.3 History of Failures

As part of the CAP and SSES Plans, HRSD is required to report descriptions of the history of failures at each pumping facility, including power loss-related and lightning strike-related SSOs from 1999 to 2008. Table B-6, Summary of Pump Station-Related SSOs, lists a history of SSOs from 1999 to October 2013. Many of the SSOs listed were caused by severe and extreme wet weather. For SSOs with an unknown quantity, the region uses -1 to indicate this uncertainty, versus 0, which could be misinterpreted.

HRSD took steps to further evaluate the history of failures for lightning strikes and dual-feed power systems which included review of maintenance and station alarm records. Since 1999, the recorded dual feed power and lightning strike related failures have been minimal, only occurring due to extraordinary circumstances. Dual feed and lightning strike power failures can be seen in Table B-3.

Pump Station	Power Feed Redundancy	Date	Cause
Park Ave	Emergency Generator	7/24/1999	Lightning Strike
Arctic Ave	Dual-Feed	9/19/2003	Hurricane Isabel
Bloxoms Corner	Dual-Feed	9/18/2003	Hurricane Isabel
Norchester	Dual-Feed	8/5/2009	Lightning Strike
Washington District	Dual-Feed	11/12/2009	November nor'easter

## 2.4 SCADA Systems

### SCADA Equipment / Programming

As part of the CAP and SSES Plans, HRSD evaluated the SCADA Equipment / Programming at its pumping facilities. The CAP and SSES Plans noted several alarms and indications to be tested or assessed, if available:

- Wet well high level and low level alarms
- Dry well flood alarms
- Dry well sump pumping failure
- Any of the following power anomalies:
  - Loss of utility power
  - Single phase condition
  - Over-voltage and under-voltage

- Use of standby power
- Failure of standby power
- Use of alternate power source
- Loss of alternate power source
- Pump failure

### SCADA Evaluation Procedure

The HRSD SCADA alarms were evaluated using two methods. The first method was a visual examination of the equipment during the Pump Station Condition Assessment Inspections. Each alarm panel was opened and observed for physical condition defects. The results of that inspection are reported within the Pump Station Facility Inspections Results section (Section 6) of this report.

The second method of evaluation consisted of data review that included completed maintenance activities, SCADA alarm records and SSO records. Specific procedures for evaluation of each alarm from the CAP and SSES plans are described in the following subsections. Some alarms were assessed for proper operation by evaluating events where operational circumstances should have produced an alarm. For example, where wet well cleaning activities emptied the wet well, records were reviewed to confirm that a wet well low level alarm was triggered.

**Wet well high level alarm.** HRSD uses two alarms to indicate a high water level in the wet well. The alarms are tested monthly as part of the scheduled maintenance program according to the established procedures.

The first test utilizes the built-in self-test functionality for the level indicating instrumentation. HRSD uses several names for this alarm depending on the station including “High Wet Well” and “High Level.” The second test involves moving the wet well alarm float upward and ensuring that the wet well high level alarm is received at the Operations Control Center. To conclude the test, the float is returned to the normal position and the alarm displays “normal” at the Operations Control Center. HRSD uses several names for this alarm depending on the station including “Float Ball” and “Flygt Ball.”

The results of the tests at each applicable station from the May and June 2012 round of testing are presented in Table B-7 under the column heading Wet Well High Level Alarm. A result of “Yes” means that the both alarms were operating properly on the day of the test and “No” means a failed alarm test. “N/A” means that the station does not have a wet well.

**Wet well low level alarm.** The wet well low level alarm was assessed by reviewing historic SCADA alarm records and comparing with maintenance records. HRSD routinely performs maintenance activities that reduce the wet well water level to a point below the wet well low level alarm trigger level. These maintenance activities include draw down, inspection or cleaning of wet wells. SCADA alarm records were reviewed to see if the maintenance activities triggered alarms as expected. There are also instances where HRSD has documented an operational test of wet well low level alarms after corrective maintenance activities. The results of the assessment at each applicable station are presented in Table B-7 under the column heading Wet Well Low Level Alarm. The notes within the Wet Well Low Level Alarm column explain the assessment of each applicable station wet well low level alarm. “N/A” means that the station does not have a wet well. HRSD generally uses the name “Low Wet Well” to refer to this alarm.

**Dry well flood alarm.** The dry well flood alarm is tested monthly as part of the scheduled maintenance program according to the established procedure. The test involves moving the float upward and ensuring that the dry well flood alarm is received at the Operations Control Center. The results of the test at each applicable station from May and June 2012 are presented in Table B-7 under the column heading Dry Well Flood Alarm. A result of “Yes” means that the alarm was operating properly on the day of the test

and “No” means a failed alarm test. “N/A” means that the station does not have a dry well. HRSD uses several names for this alarm depending on the station including “Dry Well Flooding” and “Dry Well Autocon.”

**Dry well sump pumping failure.** HRSD does not use an alarm specifically for dry well sump pumping failure. Instead, the dry well flood alarms are utilized to prevent critical equipment failures as a result of a failed sump pump.

**Power anomalies.** HRSD uses different sources of primary (utility) power and redundant power at pump stations. There are stations which have dual-feed power from the local utility, stations with standby power generators and stations with a single power source. Each of the various power anomaly alarms listed in the CAP and SSES plan are applicable to only certain stations with the exception of loss of utility power. The assessment procedure of each power anomaly alarm is listed below. The results of the alarm assessment at each station are presented in Table B-7 under the applicable column headings. For alarms tested as part of the scheduled maintenance program, results from the May and June 2012 round of testing are reported. A result of “Yes” means that the alarm was operating properly on the day of the test and “No” means a failed alarm test. “N/A” means that the station does not have the listed alarm. Some table entries are notes that summarize the results of the applicable assessment.

- **Loss of utility power.** For stations with an emergency generator, the loss of utility power alarm is tested monthly as part of the scheduled maintenance program according to the published procedure. The test includes starting and running of the emergency generator and notes how the alarm sequence should follow the generator operation.
  - For stations with dual-feed, the loss of utility power alarm is tested monthly as part of the scheduled maintenance program according to the established procedure. The established procedure is explained in the “Use of alternate power source” section below.
  - For stations without an emergency generator or dual-feed, HRSD has a test function which temporarily creates the conditions of a power loss at the station. The procedure involves using the local test function, verifying alarm transmission and verifying proper operation of the station after testing.
  - HRSD generally uses the name “Vepco Power” to refer to this alarm.
- **Single phase condition, over-voltage and under-voltage.** In some pumping facilities, HRSD has equipment that reports local alarms in the event of a Single Phase Condition or over-voltage and under-voltage. These secondary local alarms are not paged by the SCADA system. The conditions which lead to these alarms are more likely to cause a long-term maintenance issue than an SSO.
  - If the conditions which lead to these alarms lead to a situation which may cause an SSO, a paged alarm will be sent. For example, if a power supply anomaly causes a pump to not start when the control signal is given, a pump fail alarm will be paged to the duty system supervisor for action.
- **Use of standby power.** For stations with an emergency generator, the use of standby power alarm is tested monthly as part of the scheduled maintenance program according to the published procedure. The test includes starting and running of the emergency generator and notes how the alarm sequence should follow the generator operation, i.e., “alarm will indicate [utility] power ‘off’ and generator/alternate power ‘on’.” HRSD uses several names for this alarm depending on the station including “Generator Power” and “Generator.” When using “Generator” to refer to this alarm, the alarm conditions are “on” or “off”.
- **Use of alternate power source.** The use of alternate power source alarm is tested monthly as part of the scheduled maintenance program according to the established procedure. The test consists of manually switching the power source at the station from primary to alternate. After a

preset time period, the power switches back to primary. The subject alarms are verified at the Operations Control Center. HRSD uses several names for this alarm depending on the station including “Alternate Power” and “Alt Power.”

- **Failure of standby power / Loss of alternate power source.** HRSD reviewed pump station SSO records and the corresponding SCADA alarm records from 1999 to 2011 to determine if there were any instances of an SSO that was exacerbated by a malfunction of the failure of standby power alarms or the loss of alternate power source alarms; meaning the alarm conditions occurred but no alarm was paged. There were no instances of this situation occurring in the records. HRSD generally uses the name “Generator” to refer to failure of standby power alarm with the alarm conditions being “fail” or “normal” and “Alt Power Available” to refer to loss of alternate power source.
  - This alarm is an indication of a temporary lack of redundancy in the pump station power supply. If the station is experiencing an actual power loss then the use of standby / alternate power and utility power alarms will give that indication.

**Pump failure alarm.** The transmission of pump failure alarms is tested as part of the regular maintenance program at HRSD stations by shutting power off to the selected pump controller. It is difficult to perform a test which simulates the conditions which actually trigger a pump failure alarm; therefore HRSD has performed an assessment of pump failure alarms in addition to the transmission test at stations. HRSD reviewed pump station SSO records and the corresponding SCADA alarm records from 1999 to 2011 to determine if there were instances of an SSO that was exacerbated by a malfunction of pump failure alarms; meaning the alarm conditions occurred but no alarm was paged. The review showed that no SSOs have occurred as a result of an improperly operating pump failure alarm.

### SCADA Recommendations

HRSD did not find assets that present material risk of failure in this evaluation of the SCADA Equipment / Programming. It should be noted that HRSD is in the process of upgrading the SCADA system under the Interim System Improvements. Pump station SCADA panels will be upgraded and provisions made for an integrated pump station control platform that will support local-automatic controls and remote supervisory control

### Results of Evaluation Summary

Table B-7 summarizes the results of the alarm assessments by HRSD. Each alarm has either a “Yes”/“No” value to report proper function or notes which explain how the alarm was verified to be operating properly and an associated date which is the date that the alarm was transmitted.

## 2.5 Pumping Facility Comparison to Virginia SCAT Regulations

As part of the CAP and SSES Plan, HRSD is required to report details on how the existing HRSD pumping facility equipment compares to Virginia Sewage Collection and Treatment (SCAT) Regulations (however, as documented in the approved CAP and SSES Plans, it is noted that DEQ has informed HRSD that pumping facilities constructed before the SCAT regulations are only required to be improved if the facility is expanded/upgraded). The Virginia SCAT Regulations (9 VAC 25-790) govern most municipal and large flow sewer systems. They also contain requirements for system design, operation, and maintenance not contained in the Virginia Sewage Handling and Disposal Regulations.

The applicable portion of the VA SCAT Regulations is contained within Part III Manual of Practice for Sewage Systems and Treatment Works, Article 2 Sewage Pump Stations. Part III, Article 2 is divided into seven sections which are listed below.

- 9VAC25-790-380. Sewage Pumping.
- 9VAC25-790-390. Reliability.
- 9VAC25-790-400. Pumping Equipment.
- 9VAC25-790-410. Portable Equipment and Diversions.
- 9VAC25-790-420. Alarm Systems.
- 9VAC25-790-430. Alternatives.
- 9VAC25-790-440. Force Mains.

To compare the existing HRSD pump stations to the SCAT Regulations Sections listed above, HRSD performed a detailed analysis utilizing a checklist with various attributes. The attributes were based on the general criteria and minimum standards presented in the SCAT Regulations. Most of the stations have been in service for many years and documentation regarding the design and construction of the stations is not always available.

HRSD accessed existing record drawings, specifications, interior and exterior photos (both historical and from recent inspections), pump curves, arc-flash one-line diagrams, maintenance records, flooding /emergency studies conducted by HRSD and localities, geographic information systems (GIS) maps including survey data, generator sizing software, the Regional Hydraulic Model, operational knowledge of HRSD staff, research with stakeholders (US Navy, Localities, Dominion Virginia Power), FEMA Flood Insurance Rate Maps (FIRMs), the Preliminary Capacity Assessment Report, Flow, Pressure and Rainfall (FPR) Monitoring site information and data, and Google Maps. The quality, breadth and depth of the available information varied greatly between pump stations with older stations typically being more challenging to determine definitive results.

The possible outcomes of the comparison include “Y”/(Yes) meaning the criteria is verifiable from the documentation, “N”/(No), or “INA”/ (Information not available) for criteria / stations which are not verifiable.

### **2.5.1 9VAC25-790-380. Sewage Pumping.**

The Sewage Pumping section of the VA SCAT Regulations provides general criteria and minimum standards for owners making design decisions regarding pump station location, flood mitigation, pumping capacity, sewage pump features, pump control and operation, ventilation, protection of public water supply, and wet wells. Specific results from the Sewage Pumping section comparison are listed below.

- *Stations shall be physically located above the 100-year flood/wave action or otherwise protected against the 100-year flood/wave action damage.*
  - HRSD considered survey data and compared it to the FEMA FIRMs. Those stations with flooding elevations above the FIRM 100-year Base Flood Elevation (BFE) were considered to meet the guideline above. Stations with flooding elevations below the BFE were considered to not meet the 100-year flood guideline.

As a planned operational measure, HRSD uses “storm boards” at some stations. These storm boards consist of a concrete barrier that has been poured around the entrance of the station with a removable steel plate insert. This insert is left off during dry weather. When flooding events are anticipated, HRSD inserts the steel plate and uses sandbags on the inside and outside of the plate. This measure has proven effective in providing approximately 3 feet of protection above the finished floor elevation. Stations with storm boards are footnoted in Table B-8A and are considered to meet the criteria if the boards provide protection to the 100-year elevation.

- *Stations shall be designed to be fully operational during the 25-year flood/wave action.*
  - 25-year flood/wave action is not readily available from FEMA so HRSD used data contained in a coastal flooding study conducted by the City of Norfolk (Preliminary Coastal Flooding Evaluation and Implications for Flood Defense Design, July 2010) to estimate the 25-year flood/wave action for the stations with flooding elevations below the 100-year BFE. The coastal flooding study identified recurrence intervals and the associated tide level at the NOAA tide gauge at Sewell's Point. A tide elevation of +6 feet at Sewell's Point corresponds approximately to a 25-year return period flood water depth. The data contained in the study also predicted flood water elevations with ancillary effects (winds, rainfall and storm water discharge) for a +6 foot tide for the City of Norfolk. HRSD used these flood elevations to screen whether or not a station would be fully operational during a 25-year flood/wave action event. For other stations in Chesapeake and Hampton, where similar information was not available, HRSD conservatively used 7.5 feet per NAVD88 as an estimate for the 25-year flood/wave action. Stations with flooding elevations above the 25-year flood/wave action were considered to meet the criteria. Additionally, stations with storm boards are also considered to meet the criteria if the boards provide protection to the 25-year elevation.
- *At least two pumping units shall be provided.*
  - Record drawings and photographs were used to determine that every HRSD pump station has at least two pumping units installed
- *Pumping units shall be designed to fit actual flow conditions and must be of such capacity that, with any one unit out of service, the remaining units will have capacity to handle the maximum sewage flow or a minimum of 2-1/2 times the average design flow, whichever is greater.*
  - HRSD compared the peak hour flow observed during the FPR monitoring period to the PS design firm capacity. The peak hour flow exceeded 2-1/2 times the average daily flow in all cases. This information is contained in Table B-9, which is the same table submitted to address EPA/DEQ comments to the Preliminary Capacity Assessment Report. The following points should be noted:
    - The FPR peak hour flows are not associated with a level of service; thus the observed maximum sewage flow may be associated with an extreme wet weather event beyond the maximum level of service under consideration.
    - Design flows were not available.
    - The need for capacity upgrades to achieve the desired level of service will ultimately be established in the Regional Wet Weather Management Plan (RWWMP).
- *Pumps shall be capable of passing spheres of at least three inches in diameter.*
  - HRSD reviewed pump curves, specifications, record drawings to evaluate this criterion. Only Ferguson Park PS does not meet the three inch solid criteria. The pumps at Ferguson Park PS are rated to pass a 2.75-inch solid.
- *A check valve is to be placed on each discharge line between the shut-off valve and the pump.*
  - Record drawings and photographs were used to verify the presence of check valves on each pump discharge.
- *Provisions shall be made to prevent solids deposition. Wet well fillets shall have a minimum slope of one-to-one to the hopper bottom. The horizontal area of the hopper bottom shall be no greater than necessary for proper installation and function of the inlet.*
  - HRSD used record drawings and photographs to check for wet well fillets, check wet well fillet slopes and to assess the horizontal area in the wet well.



- In general, there are readily identifiable provisions to prevent solids deposition at most HRSD pump stations. Sixty-three of 66 stations have wet wells with sloped bottoms that are used to prevent the settling of solids. There are two flat bottom wet wells. Many of the stations have wet well fillet slopes of less than one-to-one. In order to assess the hopper bottoms, HRSD used a rule of thumb that the flat surface in the wet well from the suction-pipe-wall to the toe of the fillet (trench width) should be no more than 2.5 times the suction bell width or suction channel width, whichever is applicable. In the case of submersible pumps, the wet well flat surface should be no more than 2.5 times the width of the pump as shown in the section view. Stations not meeting all of the wet well criteria are listed below with an explanation of the deviation(s):
  - PS 101 Arctic Ave – Fillet slopes of approximately 3:4 and 1:1 are present.
  - PS 102 Ashland Circle – Trench width is approximately 3.0 times the suction bell diameter.
  - PS 103 Bainbridge Blvd – Fillet slope is approximately 1:6; Trench width is approximately 2.7 times the suction bell diameter.
  - PS 104 Cedar Lane – Fillet slope is approximately 2:3.
  - PS 105 Chesapeake Ave – Fillet slope is approximately 1:9; Trench width is approximately 3.7 times the suction bell diameter.
  - PS 106 City Park - Fillet slope is approximately 1:6; Trench width is approximately 2.7 times the suction bell diameter.
  - PS 109 Dozier's Corner - Fillet slopes of approximately 3:4 and 1:1 are present.
  - PS 110 Ferebee Ave - Fillet slope is approximately 1:6.
  - PS 113 Luxembourg Ave - Fillet slope is approximately 1:16; Trench width is approximately 2.6 times the suction bell diameter.
  - PS 114 Monroe Place – The existing records are insufficient to confirm slopes and bottom measurements. Photographs show a mild slope with a trench.
  - PS 116 Norchester St – Fillet slope is approximately 1:10 with no flat areas.
  - PS 117 North Shore Rd - Fillet slope is approximately 1:6; Trench width is approximately 2.7 times the suction bell diameter.
  - PS 118 Norview Ave - Fillet slope is approximately 1:6; Trench width is approximately 2.7 times the suction bell diameter.
  - PS 119 Park Ave – The maximum fillet slope is approximately 5:14 with no flat areas.
  - PS 121 Plume St – Fillet slope is approximately 1:4.
  - PS 122 Powhatan Ave – Fillet slope is approximately 1:6; Trench width is approximately 2.7 times the suction bell diameter.
  - PS 123 Quail St – Fillet slope is approximately 1:4.
  - PS 124 Richmond Crescent – Fillet slope is approximately 1:2.
  - PS 125 Seay Ave - Fillet slope is approximately 1:6; Trench width is approximately 3.3 times the suction bell diameter.
  - PS 128 Steamboat Creek – Fillet slope is approximately 1:6; Trench width is approximately 2.7 times the suction diameter.
  - PS 130 Virginia Beach Blvd – The existing records are insufficient to confirm slopes and bottom measurements. Photographs show a mild slope with a trench.
  - PS 131 Washington District – The existing records are insufficient to confirm slopes and bottom measurements. Photographs show a mild slope with a trench.
  - PS 132 Willoughby – Fillet slope is approximately 1:6.

- PS 141 Hanover Ave – Fillet slope is not documented but appears to be less than 1:1.
- PS 142 Jamestown Crescent – Fillet slope is not documented but appears to be less than 1:1.
- PS 144 Elmhurst Lane - Trench width is approximately 3.0 times the suction diameter.
- PS 146 Camden Ave – The wet well has a flat bottom with a wet well diameter 5.0 times the suction bell diameter.
- PS 147 Chesterfield Blvd – Fillet slope is not documented but appears to be less than 1:1.
- PS 148 Ingleside Rd – Fillet slope is not documented but appears to be less than 1:1.
- PS 201 25<sup>th</sup> St – Fillet slope is approximately 1:15.
- PS 202 33<sup>rd</sup> St – Fillet slope is approximately 1:24.
- PS 203 Bay Shore Lane – Fillet slope is approximately 1:15.
- PS 204 Bloxoms Corner – The wet well has a flat bottom; Trench width is approximately 4.1 times the suction line diameter.
- PS 206 Bridge St – Fillet slope is approximately 1:32.
- PS 207 Center Ave – Fillet slope is approximately 1:15.
- PS 208 Claremont – Fillet slope is approximately 1:50.
- PS 209 Copeland Park - Trench width is approximately 6.0 times the suction bell diameter.
- PS 210 Ferguson Park – Fillet slope is approximately 1:4.
- PS 211 Hampton University – Fillet slope is approximately 1:12.
- PS 212 Hilton School – Fillet slope is approximately 1:20.
- PS 213 Jefferson Ave – Trench width is approximately 2.6 times the suction bell diameter.
- PS 216 Lucas Creek – Fillet slope is approximately 5:12.
- PS 218 Morrison – Fillet slope is approximately 1:6.
- PS 219 New Market Creek – Fillet slope is approximately 1:10.
- PS 220 Normandy Lane – Fillet slope is approximately 1:5.
- PS 221 Patrick Henry – Fillet slope is approximately 1:4; Trench width is approximately 2.8 times the suction bell diameter.
- PS 223 Washington St – Fillet slope is approximately 1:10.
- PS 224 Woodland Rd – Fillet slope is approximately 1:5.
- PS 225 Willard Ave – Fillet slope is approximately 1:12.
- PS 227 Fort Eustis – Fillet slopes of approximately 2:3 and 1:1 are present; Trench width is approximately 2.8 times the suction bell diameter.
- PS 229 Colonial Williamsburg – Fillet slope is approximately 5.5:7.
- PS 230 Rolling Hills –Trench width is approximately 8.9 times the suction bell diameter.
- PS 231 Fords Colony –Trench width is approximately 3.4 times the suction bell diameter.
- PS 232 Greensprings –Trench width is approximately 4.1 times the suction bell diameter.

Table B-8 contains specific results from each applicable SCAT Regulations Section.

### **2.5.2 9VAC25-790-390. Reliability.**

The Reliability section of the VA SCAT Regulations states that:



*“The objective of achieving reliability protection is to prevent the discharge of raw or partially treated sewage to any waters and to protect public health and welfare by preventing backup of sewage and subsequent discharge to basements, streets and other public and private property. Provisions for continuous operability of pumping stations shall be evaluated in accordance with the appropriate reliability classification.”*

All of HRSD’s pump stations must achieve Class I Reliability. The SCAT Regulations Reliability section provides general criteria and minimum standards for owners making design decisions regarding pump station continuous operability, electrical power and power distribution so that alternative motive force sufficient to operate the station at peak flow rates being received shall be operating the station prior to the expiration of an allowable time period. Alternative motive force can be obtained by utilizing dual-feed utility power supplies, emergency standby generators, emergency standby pumps or by operating technicians who can respond with portable emergency generators or pumps. The allowable time period is generally the predicted, elapsed-time between a high wet well alarm and an SSO at peak flow rates. Specific results from the Reliability section comparison are listed below.

- *The owner shall demonstrate, to the satisfaction of the department, that the time allowances for continuous operability will be met on a 24-hour basis.*
  - HRSD used record drawings and photographs to establish which of the four allowable means for provision of continuous operability each station utilizes. Of the four allowable means, HRSD utilizes alternate power sources or auxiliary standby generators at 67 stations, permanently mounted reserve pumps for five stations and portable pump resources for nine stations. The nine stations which utilize portable pump resources are discussed in Section 2.5.4 9VAC25-790-410 Portable Equipment and Diversions. Stations which utilize reserve pumps, standby generators and dual feed are discussed below.
  - HRSD compared the capacity of the five permanently mounted reserve pumps at pressure policy to the information in Table B-9 [Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)]. At pressure policy, the reserve pumps at all five stations have capacities greater than the observed peak hour flow during the Final Flow, Pressure and Rainfall Report monitoring period. The five stations with permanently mounted reserve pumps as the method to meet continuous operability requirements are listed below and in Table B-8A. Table B-13 lists the approximate capacity at pressure policy for the reserve pumps at these stations.
    - PS 102 Ashland Circle
    - PS 106 City Park
    - PS 109 Doziers Corner
    - PS 114 Monroe Place
    - PS 125 Seay Ave
- *Auxiliary stand-by generators must be able to operate sufficient pumps to deliver the design peak flow.*
  - The original design calculations for the pump station generators were not available so HRSD used manufacturer-produced software to estimate the loads on the pump station generators. This assessment provided screening for generators that may be under-sized. This screening showed that 13 stations have estimated loads greater than the generator rating. From there, HRSD reviewed the operational history and previous testing to determine if the pump station generator has historically met the required duty conditions. For example, a three pump station would have successfully operated two pumps at full speed for a significant period of time (typically for some duration during a storm event such as Hurricane Irene). HRSD was able to

verify generators at Ford's Colony and Greensprings have historically met required duty conditions. For stations that are already scheduled for improvements, HRSD performed no such historic analysis and will defer future actions to the Rehab Plan.

- The following stations may have under-sized generators based on the screening. Rehab activities for these station generators are noted in parenthesis where applicable.
  - PS 112 Independence Blvd (CE-R4)
  - PS 113 Luxembourg Ave (VIP-R11)
  - PS 119 Park Ave (VIP-R3)
  - PS 127 State St (VIP-R4)
  - PS 134 Pughsville (Interim System Improvements)
  - PS 139 / 123 Quail Ave PRS and Quail Ave PS – The PRS is out of service.
  - PS 209 Copeland Park (BH-R7)
  - PS 215 Lee Hall – Out of service
  - PS 216 Lucas Creek (Two of the four pumps are not active)
  - PS 219 Newmarket Creek (BH-R7)
    - Of these 11 stations, seven of them are scheduled for rehab or replacement under the Rehab Plan or the Interim System Improvements as noted. Lee Hall and Quail Ave PRS's are currently inactive. Lucas Creek was designed with extra pumping capability that is not currently utilized. HRSD will consider upgrades in the event that one or all of these stations/assets need to be reactivated. The generator at Quail Ave PRS supplies the Quail Ave PS generator power and is clearly sufficient to power the PS only.
- *For Class I Reliability, electric power shall be provided by alternate feed from distribution lines which are serviced by alternate feed from transmission lines (e.g., 115 KV) where possible. The transmission lines shall have alternate feed from the generating source or sources. The capacity of each power source shall be sufficient to operate the pumps during peak wastewater flow conditions, together with critical lighting and ventilation. The requirement for alternate feed can be satisfied by either a loop circuit, a "tie" circuit, or two radial lines. Where alternate feed lines terminate in the same substation, the circuit feeding the pumping station shall be equipped with two or more in-place transformers.*
  - HRSD contacted the local power utility regarding the adequacy of the redundant power sources. Dominion Virginia Power provided a distribution redundancy table which is shown in Figure B-1. The dual-feed stations are listed below. HRSD will be adding standby generators or pumps at these stations as part of the projects listed in parenthesis.
    - PS 101 Arctic Ave (Level-controller-operated, hard-piped, diesel-driven pump already onsite)
    - PS 104 Cedar Lane (GN-R13)
    - PS 108 Dovercourt Rd (GN-R13)
    - PS 116 Norchester St (Interim System Improvements)
    - PS 129 Taussig Blvd (GN-R13)
    - PS 131 Washington District (GN-R13)
    - PS 204 Bloxoms Corner (GN-R13)
    - PS 211 Hampton University (GN-R13)
    - PS 217 Langley Circle (GN-R13)

- The redundancy table provided from Dominion Power in Table B-1 identifies redundant transformers and circuits for all stations except for Taussig Blvd and Hampton University. HRSD further investigated these two stations with Naval Station Norfolk and Hampton University / Dominion Virginia Power and determined that Taussig Blvd has redundant transformers and circuits. Information regarding redundancy at Hampton University is not conclusive that the transformers and circuits are redundant.

Table B-8 contains specific results from each applicable SCAT Regulations section.

### 2.5.3 9VAC25-790-400. Pumping Equipment.

The Pumping Equipment section of the VA SCAT Regulations provides general criteria and minimum standards for owners making design decisions regarding the protection of the station pumps, pump drive motors and station controls with regard to location, electrical protection, testing, generators and specifications.

Specific results from the Pumping Equipment section comparison are listed below.

- *All motors and control enclosures shall be adequately protected from moisture from the weather and water under pressure.*
  - Photographs and record drawings were used to determine that motors and control enclosures are protected from the weather and water under pressure by being contained within the building structure or through the use of weather-proof enclosures in the case of submersible stations.
- *All electrical equipment design (motors, controls, switches, conduit systems, etc.) located in raw sewage wet wells or in totally or partially enclosed spaces where hazardous concentrations of flammable liquids, gases, vapors, or dusts may be present will be evaluated in accordance with the appropriate requirements of the National Electric Codes (NEC) and VOSH requirements.*
  - HRSD used photographs and record drawings to assess if pump motors have three phase protection and low voltage protection, and if wires have moisture resistant insulation. HRSD does not use devices to convert single phase to three phase power.
    - A definitive assessment of low voltage protection was not possible from the existing records. Additionally, comprehensive assessment of wire insulation was not possible; however, all of the wires that were able to be observed appeared to be NEC compliant.
  - There are no records available to determine if concrete, metals, control and operating equipment, and safety devices were designed to protect against corrosion. However, any severely corroded conditions observed during pump station facility inspections were referred for action.
  - In addition to the VOSH and NEC references listed in the SCAT Regulations, HRSD assessed if adequate working clearance is available, if arc flash labels are present and if electrical equipment in wet wells is explosion proof.
- *The power capacity provided by the on-site emergency generator shall be in accordance with the reliability classification of the pump station.*
  - This is reviewed in Section 2.5.2. 9VAC25-790-390. Reliability.
- *The automatic start system shall be completely independent of the normal electric power source.*
  - All of the HRSD generators use batteries for starting power. These batteries are inspected regularly and replaced as necessary. All of the generator automatic start systems use batteries which are sized for 3 to 5 starts.

Table B-8 contains specific results from each applicable SCAT Regulations Section.

### 2.5.4 9VAC25-790-410. Portable Equipment and Diversions.

The Portable Equipment and Diversions section of the VA SCAT Regulations provides general criteria and minimum standards for owners making design decisions regarding the use of portable pumps or generators to meet continuous operability requirements and regarding the use of controlled diversions.

HRSD maintains a portable equipment inventory with 14 portable pumps (9 on NS; 5 on SS) and 10 portable generators (2 on NS; 8 on SS). Table B-12 provides a list of diesel-driven portable pumps and portable generators with locations. Stations that rely on portable equipment for continuous operability are listed in Table B-8A and Table B-11. This equipment supports both routine maintenance activities and continuous operability so HRSD has flexibility in the deployment of these resources.

Specific results from the Portable Equipment and Diversions section comparison are listed below.

- *Portable equipment (pumps or generator sets) shall be acceptable to satisfy the continuous operability requirements where, under critical conditions imposed by rush hour traffic, multiple pump station failures, etc., the portable equipment transportation, connection and starting can be accomplished within allowable time periods.*
  - HRSD relies on portable pump or generator resources and response crews to meet the continuous operability requirement for the stations listed below.
    - PS 118 Norview Ave
    - PS 121 Plume St
    - PS 122 Powhatan Ave
    - PS 130 Virginia Beach Blvd
    - PS 132 Willoughby Ave
    - PS 141 Hanover Ave
    - PS 142 Jamestown Crescent
    - PS 147 Chesterfield Blvd
    - PS 148 Ingleside Rd
  - All of the stations listed above were built prior to SCAT Regulations and design information regarding response times compared with allowable time periods is not available. HRSD performed an analysis of calculated response times compared with the elapsed time between the wet well high level alarm and overflow at a 2-year level of service. Results of this analysis are shown in Table B-11. The Regional Hydraulic Model was used to estimate the flow rates used to compute the elapsed time from high level alarm to overflow. Peak flows may occur at any time depending on weather conditions. HRSD used travel times that were calculated during rush-hour times to determine a conservative estimate. Additional time was added for crew mobilization, set-up, etc. An example of this analysis is included in Figure B-2. HRSD has the capability to respond to multiple failures at one time.
  - Eight of the nine pump stations evaluated do not meet response time criteria as listed in Table B-11. HRSD has elected to eliminate the need for response crews at all nine stations and will be adding standby generators or pumps as part of the projects listed in parenthesis next to each station.
    - PS 118 Norview Ave (GN-R13)
    - PS-121 Plume St (GN-R13)
    - PS 122 Powhatan Ave (VIP-R10)
    - PS 130 Virginia Beach Blvd (GN-R13)

- PS 132 Willoughby Ave (GN-R13)
- PS 141 Hanover Ave (VIP-R10)
- PS 142 Jamestown Crescent (VIP-R10)
- PS 147 Chesterfield Blvd (Station to be abandoned)
- PS 148 Ingleside Rd (VIP-R8)
- *Pumping units shall have capability to operate between the wet well and the discharge side of the station.*
- *Each station served by portable pumping equipment shall facilitate rapid and easy connection of lines.*
  - HRSD used record drawings and photographs to determine that all of the HRSD wet well pump stations have an emergency pump connection (EPC) into the discharge force main. The EPCs are blind-flanged and valved to facilitate rapid and easy connection of lines. Emergency pumps are able to have suction directly in the wet well or through an existing pump suction line and discharge to the force main.

Table B-8 contains specific results from each applicable SCAT Regulations Section.

### 2.5.5 9VAC25-790-420. Alarm Systems.

The Alarm Systems section of the VA SCAT Regulations provides general criteria and minimum standards for owners making design decisions regarding station alarms to meet the appropriate reliability requirements. Specific results from the Alarm Systems section comparison are listed below.

- *The alarm system shall monitor the power supplies to the station, auxiliary power source, failure of pumps to discharge liquid and high liquid levels in the wet well and in the dry well.*
  - Maintenance records were used to determine that HRSD has power source and liquid level alarms at all of its pump stations. No HRSD station has an alarm for failure of pumps to discharge liquid. HRSD uses high wet well liquid level alarms to respond to the types of failures which would cause a failure to discharge liquid alarm. Additionally, there are indications, such as lag pump-on in an unusual circumstance (such as during dry weather) that HRSD may use to respond.
- *An on-site audio-visual alarm system shall be provided such that each announced alarm condition is uniquely identified.*
  - HRSD alarms are uniquely identified to the pump station operators and supervisors via cellular phones. Since HRSD does not operate manned stations, this system exceeds the minimum standard presented in the SCAT Regulations.
- *Test circuits shall be provided to enable the alarm system to be tested and verified to be working properly.*
  - All of HRSD's pump stations have a switch for "Testing Alarms." These are utilized monthly as part of the HRSD preventive maintenance program.
- *Provisions shall be made for transmitting a single audible alarm signal to a central location where personnel competent to receive the alarm and initiate corrective action are available 24 hours per day.*
  - HRSD alarms are transmitted (paged) to a central location and to the appropriate duty personnel for action automatically.

- *A backup power supply, such as a battery pack with an automatic switchover feature, shall be provided for the alarm system, such that a failure of the primary power source would not disable the alarm system.*
  - The alarm systems have a back-up battery supply that is independent of the station power supply and is alarmed for lack of readiness.

Table B-8 contains specific results from each applicable SCAT Regulations Section.

### **2.5.6 9VAC25-790-430. Alternatives.**

The Alternatives section of the VA SCAT Regulations provides general criteria and minimum standards for owners making design decisions regarding the use of suction lift pumps, submersible pumps, pneumatic ejectors, grinder pumps and septic tank effluent pumps. HRSD does not utilize suction lift pumps, pneumatic ejectors, grinder pumps or septic tank effluent pumps.

Specific results related to submersible pump stations from the Alternatives section comparison are listed below.

- *Submersible pumps shall be provided with equipment for disconnecting, removal, and reconnection of the pump without requiring personnel to enter the wet well.*
- *Owners of submersible pumping facilities shall provide a hoist and accessories for removing pumps from the wet well.*
- *Electrical controls shall be located in a suitable housing for protection against weather and vandalism.*
- *The shut-off valve and check valve on the discharge lines of pumps operating at flows greater than 25 gallons per minute (gpm) shall be located in a separate vault outside of the wet well allowing accessibility for inspection and maintenance.*
  - HRSD reviewed record drawings, photos and referred to operator knowledge. All of HRSD's submersible pump stations meet all of the above specific criteria and minimum standards for submersible pump stations. HRSD provides tripods or other hoisting gear as necessary for crews entering wet wells.

Table B-8 contains specific results from each applicable SCAT Regulations Section.

### **2.5.7 9VAC25-790-440. Force Mains.**

The Force Mains section of the VA SCAT Regulations provides general criteria and minimum standards for owners making design decisions regarding force main sizing, air relief valve placement, materials selection and installation. HRSD operates a unique sewer system consisting primarily of manifolded force mains. For the purposes of this assessment, only the force mains (discharge manifolds) contained within the stations were considered. Specific results from the Force Mains section comparison are listed below.

- *Force mains shall be sufficiently anchored within the pump station.*
  - HRSD used photographs and record drawings to determine that all of the force mains within the pump stations are anchored by thrust blocks, mechanical joints, joint restraints and/or by casting the pipe into the dry well or wet well wall.

Table B-8 contains specific results from each applicable SCAT Regulations Section.



Station Names	Location	Station #'s	Dominion Acct	Distribution Redundancy
<b>SOUTH SHORE PUMP STATIONS</b>				
Arctic Avenue	2814 Arctic Avenue, Virginia Beach	101	1820300000	Redundant Tx & Circuit
Ashland Circle	1402 Ashland Circle, Norfolk	102	3390815003	No Redundancy
Cedar Lane	3915 Cedar Lane, Portsmouth	104	9516322501	Redundant Tx & Circuit
City Park	Ft of La Vallette Avenue, Norfolk	106	800630006	No Redundancy
Dovercourt Road	948 Dovercourt Road, Norfolk	108	7446142502	Redundant Tx & Circuit
Dozier's Corner	1121 Keats Street, Norfolk	109	6921167505	No Redundancy
Hanover Avenue	900 Hanover Avenue, Norfolk	141	6790480005	No Redundancy
Jamestown Crescent	858 Jamestown Crescent, Norfolk	142	6870465009	No Redundancy
Monroe Place	5808 Monroe Place, Norfolk	114	9170495007	No Redundancy
Norchester Street	935 Norchester Street, Norfolk	116	6436357500	Redundant Tx & Circuit
Norview Avenue	869 Norview Avenue, Norfolk	118	0000915009	No Redundancy
Plume Street	236 E. Plume Street, Norfolk	121	0892417502	Redundant Tx & Circuit
Powhatan Avenue	1548 Buckingham Avenue, Norfolk	122	3000507503	No Redundancy
Seay Avenue	3541 Seay Avenue, Norfolk	125	9700020002	No Redundancy
Taussig Blvd	2017 Taussig Blvd, Norfolk	129	6801655009	No Redundancy
Virginia Beach Blvd	3514 E. Virginia Beach Blvd, Va. Beach	130	0892420001	No Redundancy
Washington Plant	1728 Great Bridge Blvd, Chesapeake	131	6476310005	Redundant Tx & Circuit
Willoughby Avenue	1912 Willoughby Avenue, Norfolk	132	5561477505	No Redundancy
<b>North Shore Pump Stations</b>				
BLOXOMS CORNER	5 BEACH ROAD, HPT.	204	1774267478	Redundant Tx & Circuit
HAMPTON UNIV.	54 SHORE DR. HPT	211	3491757500	No Redundancy
JEFFERSON AVE.	B.H.T.P.	213	9126250001	No Redundancy
LANGLEY CIRCLE	7 THORNROSE AVE. HPT.	217	8215114433	Redundant Tx & Circuit

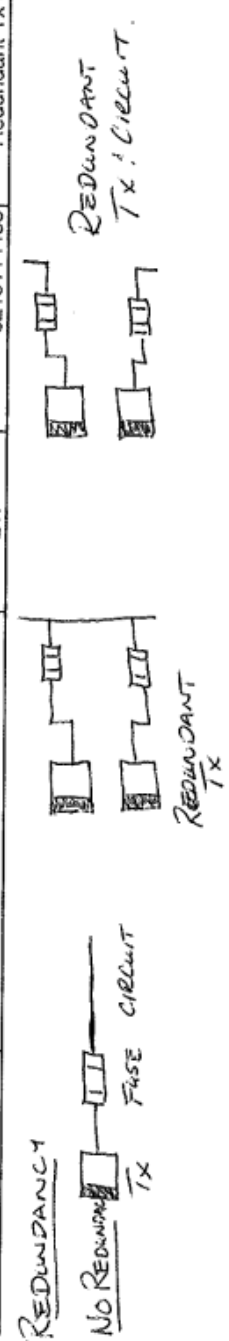


Figure B-1. Pump Station Dual-Feed Redundancy (provided by Dominion Power)

**Sample Calculation for Crew Response Time during Emergency Events**

Anticipated Response Time (ART) Factors

1. A period of 15 minutes for recognition of the high wet well alarm and appropriate response decision.
2. A period of 45 minutes for the assignment and mobilization of a response crew.
3. A period of time to travel to response location. Assuming response crew leaves from HRSD’s Main Operations Center located at 1434 Air Rail Avenue, Virginia Beach, VA. Travel time was calculated using the online mapping service, Google Maps, and averaged for morning and evening rush hours in Hampton Roads.
4. A period of 25 minutes for assigned crew to hook up appropriate portable pump and/or generator at the site.

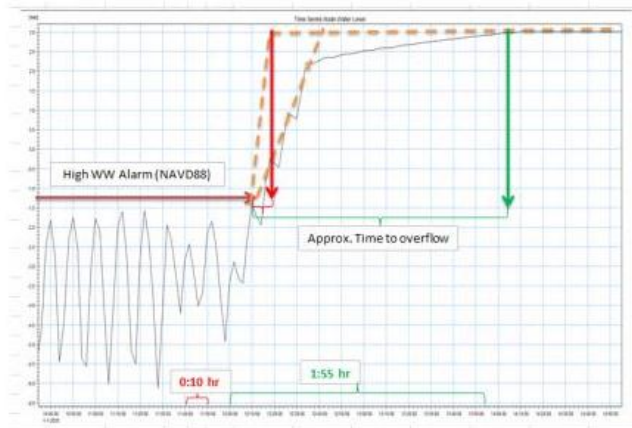
Critical Response Time (CRT) Factors

1. CRT is defined as the elapsed time between the wet well high level alarm and overflow.
2. For purposes of this analysis the Regional Hydraulic Model was used to compute the CRT using a 2 year level of service.
3. The outputs of the model include flow rates and water surface elevations (WSEs) of wet wells and the upstream structures. HRSD used the lowest rim (or hatch) elevation as the elevation where overflow will first occur. The CRT was established by observing the rate of change of the WSE and assuming that this rate would continue after the pumps shut down (i.e. power failure). The rate was assessed during normal pump off cycles to the extent practicable. The time elapsed between the high wet well alarm and overflow, according to the assuming rate of WSE change is the CRT.

Anticipated Response Time, Sample Calculation for HRSD PS #142 Jamestown Crescent

Pump Station Number	142
PS Name	JAMESTOWN CRESCENT
Address	858 Jamestown Crescent, Norfolk
Average Travel Time from Operations to Site using Google Maps during heavy traffic times	21 mins
Time for Recognition of Alarm	+ 15 mins
Time for assignment and mobilization of crew response	+ 45 mins
Time for crew to hook up portable equipment	+ 25 mins
<b>Total Anticipated Response Time (ART)</b>	<b>=106 mins</b>

Critical Response Time, Sample Graph from RHM Analysis for HRSD PS #142 Jamestown Crescent



**CRT is approximately 10 minutes.**

In this case, the ART of 106 minutes exceeds the CRT of 10 minutes; therefore this station does not meet the requirement for crew response.

**Figure B-2. Example Response Time Calculation**



## **2.6 Comparison of Flow Data and Upstream Locality Peak Flow Thresholds to Existing Pumping Capacity**

As part of the SSES Plan, HRSD was required to prepare a comparison of flow data and upstream locality Peak Flow Thresholds (PFTs) to the existing pumping capacity of the HRSD wet well PS. HRSD submitted a table comparing station firm pumping capacity with locality PFTs with a response to comments on the July 2012 Preliminary Condition Assessment Report updated in April 2013. The updated version is Table B-9 and can be found in Section 5 of this appendix. A more complete Preliminary Capacity Assessment has been performed during preparation of the Regional Wet Weather Management Plan, and was submitted to the EPA and DEQ in July 2012. No remedial actions will be taken based on the results of this interim assessment.

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## Section 3

# Pumping Facility Inspections

This section of the Final Pump Station Condition Assessment Report describes those condition assessment activities done by HRSD that consisted of primarily site inspections as well as draw-down testing. Summaries of methods and results are documented as appropriate.

### 3.1 Pumping Facility Condition Assessment Inspections.

HRSD accomplished two rounds of pump station inspections at every pumping facility. The condition assessment approach for the inspections focused on the following asset classes:

- **Building Condition** – Visually inspected the interior, exterior, and roof of the building for physical or structural problems and recorded defects that may lead to SSOs or unsafe conditions.
- **Pumps, Motors, and Drives** – From the manufacturer’s data plates and any up-to-date maintenance information, the following were recorded: the pump head in feet, the capacity in gallons per minute, the impeller diameter in inches for each pump and the horsepower and RPM for the motors. Inspectors observed the pumps, motors and drives for vibrations, sounds, temperature and odor. Any field observations such as cavitation, vibration or noises were made by sensory observation without the use of special instruments. These observations are not necessarily detrimental to the equipment.
  - The operating logs maintained at each pump station were reviewed. To the extent possible, the pumps were operated to simulate normal operating conditions by allowing the pumps to operate within the normal wet well levels. At some of the stations low influent flow limited the pump run time to short periods and required manual operation of the pumps at lower than normal wet well levels.
- **HVAC** – Observed HVAC system in operation. Inspectors examined filters, intakes, motors, belts, ducting and fans (when accessible) and noted if airflow seemed to be lower than expected.
- **Wet Well** – Inspected the wet well in a drawn down state to ensure a proper visual inspection. Accumulation of debris, sediment and grease buildup was removed when the wet well was drawn down for the inspection. The walls were observed for coating condition, spalling or softness of concrete, erosion of concrete and the condition of bottom fillets. For stations with visual indications of degradation, a structural test (Schmidt Hammer Test) was scheduled to evaluate the strength of the concrete. The structural tests were performed during follow-on inspections.
- **Corrosion of Ancillary Equipment** – While the wet well was in a drawn down state and after cleaning, the ventilation system ducts and fans, access hatch, interior railing, access ladder and platforms, pump control system, pump rails, and interior piping were inspected for corrosion.
- **Dry Well** – Inspected the dry well for visible structural conditions of concern.
- **Piping** – While the pump station was operating, visually inspected the piping, valves (check, isolation, surge relief and air relief) and other fittings for corrosion, leakage, and coating system condition.
- **Emergency Generator** – Observed the generator while running under typical daily load to verify its operation, noting excessive noise, excessive vibration, dark exhaust, and ease of

generator/pump starting. The generator was tested to ensure that it will automatically start upon loss of power.

- **SCADA Equipment** – Observed the visual condition of the SCADA system. It should be noted that the SCADA alarms were also assessed by a record review as described in Section 2.4.
- **Pump Draw-down Tests** – Performed pump draw-down tests at HRSD wet well pumping stations to determine actual pump operating conditions. These results were compared to manufacturers' curves to identify anomalies that may be indications of excessive wear. HRSD also performed an assessment of pump operating conditions using data from the HRSD Telog® system. Drawdown tests are described in Section 3.3.
- **Lightning Strike Protection** – Evaluated the protection, if any, in place at each pumping station against lightning strikes. Grounding equipment was inspected and documented. Records and operators' knowledge were reviewed to identify whether a station is prone to lightning strikes which cause an outage that results in SSOs.

Each asset was assigned a condition and performance score and field observations were noted as appropriate. Condition and Performance scores were used to evaluate assets as described below.

### Condition and Performance Scores

The pumping facility assets were evaluated using condition and performance rankings. Each asset was scored using the following guidelines:

#### Condition

1. Excellent
2. Slight Visible Degradation
3. Visible Degradation
4. Integrity of Component Moderately Compromised
5. Integrity of Component Severely Compromised

#### Performance

1. Component Functioning as Intended
2. In-service, but Higher than Expected O&M
3. In-service, but Function is Impaired
4. In-Service, but Function is Highly Impaired
5. Component is not Functioning as Intended

### Condition & Performance (C&P) Regions

The C&P rankings for the pumping facilities were then used to make recommendations. These recommended actions were categorized into Regions depicted in Figure B-3. The recommended actions corresponding to the regions are intended to be used as a guide for further action.

		Performance Ranking				
		1	2	3	4	5
Condition Ranking	1	Region 1		Region 2	Region 4	Region 5
	2					
	3	Region 2				
	4	Region 3				
	5					

Figure B-3. Condition and Performance Regions

**Region 1 - Good Condition and Performance Ranking (both C&P Rankings are low)**

The assets with low C&P ranking scores of 1 or 2 are in this category. Recommended action for these types of assets is “No immediate action required” as no failure is expected for assets categorized in this region.

**Region 2 - Moderate Condition and Performance Ranking**

The assets with at least one moderate ranking score of 3 will be in this category. Recommended action for these types of assets is “Continue scheduled maintenance activities” so that these assets may be monitored for deteriorating conditions. Assets without a performance ranking assigned due to lockout, tagout, or other reasons specified in the asset comments, were placed in this category.

**Region 3 - Poor Condition Ranking**

The assets with poor condition ranking scores of 4 or 5, but which are performing well (performance ranking scores of 1, 2, or 3) are in this category. Recommended action for these types of assets is “Schedule Corrective Action”. Although the assets are in service and functioning, issues related to the condition of these assets should be addressed.

**Region 4 - Poor Performance Ranking**

The assets with poor performance ranking scores of 4 or 5, but with condition ranking scores of 1, 2, or 3 are in this category. Recommended action for these types of assets is “Corrective Action Required” as the asset is not functioning properly.

**Region 5 - Poor Condition and Performance Ranking**

The assets with poor condition and poor performance scores of 4 or 5 will be in this category. Recommended action for these types of assets is “Replace / Refurbish” as the asset is not functioning properly and the integrity of its components are either moderately or severely compromised. Assets in this category were evaluated to see if consideration for Prompt Repair was warranted.

In addition to the C & P ranking, common field observations were recorded for each asset class. These common field observations are referred to as Notable Field Observations and are listed in the pump station asset condition summary tables. For Electrical Equipment, the field observations are listed if one or more electrical components have the observation. For example, if the lighting panel is obsolete because of lack of available spaces, the “Electrical Equipment has Obsolete Components” observation is listed. The Notable Field Observations, as well as the inspection comments, were used to assist the inspector in determining the ratings for each asset.

Assets in C & P Regions 3, 4 and 5 represent the potential candidates for the Rehab Plan and are summarized with an addressing activity in Table B-4. The addressing activity field was determined based

on evaluating whether or not an asset presented a material risk of failure for the station and is populated with one of the following four options:

- A Rehab Project Number, which is associated with a Rehab Project
- “Interim System Improvements”, which are the specific projects identified in the Consent Decree and are not part of the Rehab Plan
- “Rehab during CAP” is assigned when an asset has already been addressed (or work is currently being performed) through the CIP or Prompt Repairs Program. These assets need some type of corrective action but rehabilitation / replacement is underway or has already been performed.
- “N/A” is assigned to assets which do not present material risk of failure and no action is required under the Rehab Plan.

A detailed listing of the Condition and Performance scores and regions of each evaluated asset is located in Section 6.

**Table B-4. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Description	Condition and Performance Region	Comments	Addressing Activity
110	Ferebee Avenue	Wet well	5	None	GN-R3
116	Norchester Street	Wet well	5	None	Interim System Improvements
145	Rodman Avenue	Wet well	5	Prompt Repair Program	Rehab During CAP
148	Ingleside Road	Wet well	5	Wet well hatch to be addressed in Prompt Repair Program. Station to be addressed as part of VIP-R8	VIP-R8
207	Center Ave	Influent Valve	5	Maintenance action - HRSD able to isolate wet well using other means. Station is being replaced under Interim System Improvements	Interim System Improvements
226	Williamsburg	Influent Valve	5	Maintenance action - HRSD able to isolate wet well using other means	N/A
211	Hampton U	Discharge Isolation Valve	4	Maintenance action - HRSD able to perform maintenance on pump	N/A
217	Langley Circle	Influent Valve	4	Maintenance action - HRSD able to isolate wet well using other means	N/A
225	Willard Ave	Discharge Isolation Valve	4	Maintenance action - HRSD able to perform maintenance on pump	N/A
103	Bainbridge Blvd	Wet well	3	None	GN-R3

**Table B-4. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Description	Condition and Performance Region	Comments	Addressing Activity
108	Dovercourt Rd	Wet well	3	None	GN-R3
113	Luxembourg Ave	Wet well	3	None	VIP-R11
113	Luxembourg Avenue	Building	3	None	VIP-R11
115	Newtown Road	Wet well	3	None	GN-R3
117	North Shore Rd	Wet well	3	None	GN-R3
118	Norview Ave	Wet well	3	None	GN-R3
124	Richmond Crescent	SCADA	3	None	VIP-R10
125	Seay Avenue	Influent Valve	3	Maintenance action - HRSD able to isolate wet well using other means	N/A
127	State Street	Electrical Equipment	3	None	VIP-R4
129	Taussig Blvd	Influent Valve	3	Maintenance action - HRSD able to isolate wet well using other means	N/A
129	Taussig Blvd	HVAC System	3	None	Rehab During CAP
129	Taussig Blvd	Bubbler Panel	3	None	AB-R1
130	Virginia Beach Blvd	Wet well	5	None	GN-R3
131	Washington District	Wet well	3	None	GN-R3
132	Willoughby Ave	Wet well	3	None	GN-R3
133	Providence Road	Control Panel	3	None	Interim System Improvements
141	Hanover Ave	Wet well	3	None	VIP-R10
142	Jamestown Crescent	Wet well	3	None	VIP-R10
143	Shipps Comer	Control Panel	3	None	AT-R3

**Table B-4. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Description	Condition and Performance Region	Comments	Addressing Activity
144	Elmhurst Lane	Influent Valve	3	Maintenance action - HRSD able to isolate wet well using other means	N/A
145	Rodman Avenue	Influent Valve	3	Maintenance action - HRSD able to isolate wet well using other means	N/A
147	Chesterfield Blvd	Wet well	3	Station to be abandoned	Interim System Improvements
154	RT 337	Check Valve	3	Not critical for SSO prevention	N/A
202	33rd Street	Bubbler Panel	3	None	Interim System Improvements
202	33rd Street	Electrical Equipment	3	None	Interim System Improvements
202	33rd Street	Transfer Switch	3	None	Interim System Improvements
202	33rd Street	Wet well	3	None	Interim System Improvements
203	Bay Shore	Electrical Equipment	3	None	BH-R7
204	Bloxoms Corner	Wet well	3	None	GN-R3
214	Kingsmill	SCADA	3	None	Interim System Improvements
215	Lee Hall PRS	Control Panel	3	Station out of service	N/A
215	Lee Hall PRS	Electrical Equipment	3	Station out of service	N/A
215	Lee Hall PRS	Transfer Switch	3	Station out of service	N/A
219	Newmarket	Transfer Switch	3	None	BH-R7
226	Williamsburg	SCADA	3	None	Interim System Improvements
231	Ford's Colony	Wet well	3	None	GN-R3



## 3.2 Lightning Strike Evaluation

The purpose of the Lightning Strike Evaluation was to obtain adequate field data to effectively evaluate lightning protection at HRSD's pumping facilities. HRSD performed the following activities as part of the Lightning Strike Evaluation:

- Collected existing record drawings
- Inspected site for visible air terminals
- Inspected site for grounding wells / grounding rods
- Inspected grounding connections inside electrical equipment
- Inspected surge suppression on instrumentation and in control cabinets
- Developed a sketch of the station grounding system
- Documented existing grounding and surge suppression equipment
- Investigated the history of lightning strike related and power loss failures
- Evaluated pump station lightning strike protection with recommendations for testing and improvements

The field work above was performed during the pump station facility inspections. Lightning protection observations, a grounding system sketch and lightning protection recommendations are presented for each pump station in Section 6.

## 3.3 Pump Draw-Down Results

As part of the CAP and SSES Plan, HRSD was required to perform pump draw-down tests and report the results of the tests for each wet well pumping station. Draw down tests are used to determine pump operating conditions and can be used to identify anomalies that may be indications of excessive wear. HRSD performed draw down tests including both a field assessment in which flow and discharge pressure were field measured and also by an assessment using the Telog® system data collected continuously at each pumping facility.

### 3.3.1 Field Measurements

In general, inflow and pumping rates can be calculated with a known volume and time measurement. HRSD used this principal to calculate both wastewater inflow to PS wet wells and pumping rate of the PS pumps. By measuring the draw down (or fill) distance and keeping track of the time, the flow rate can be calculated. The volume per vertical foot is consistent with the fixed walls of the wet well. To collect pumping operating data in the field, HRSD followed a general procedure that consisted of the following steps.

- Determine elevation levels of the pressure sensor(s), pump centerlines and discharge force main.
- Perform fill and drawdown tests to estimate pump flow rates.
  - Measure filling rate to calculate wastewater inflow to wet well using method described above.
  - Use calculated wastewater inflow rate and pumping draw down time to calculate pumping rate.
  - Read the pressure in the discharge force main. Using the levels established during the station measurements, calculate the total dynamic head (TDH).

The results of the field draw down tests can be seen in Section 6 for each pump. The data collected is labeled as "2008 Drawdown Test".

### 3.3.2 Remote Data Analysis

HRSD performed a desktop analysis based on sensor data in addition to the field draw down tests. The basis for the desktop analysis was the system data which generally included wet well level, pressure, flow and other related parameters. The sensor configuration varies with each station so that the approach for determining pump operating conditions varied between stations.

#### 3.3.2.1 Pump Station Data Sensors

Generally, pressure sensors are installed at pump stations that discharge to manifolded force mains but not on lift station discharge force mains (lifting mains). For the purposes of this analysis, stations without pressure sensors have an assumed pressure based on the previously measured field draw down test results.

For flow data, there are both influent gravity flow meters and pressure-side flow meters. Flow was evaluated on an hourly average for stations with influent gravity flow meters and compared to the pump run times to calculate the pumping rate. For pressure-side flow meters, 2-minute flow data time steps were used unless 2-second data collection was deemed necessary.

There is potential for the flow data to change significantly within a time step if a pump is not running throughout the entire time step, referred to as a 'partial interval' in this document. A data quality check was done to ensure that partial intervals were removed or accounted for.

Another useful data parameter is the pump speed output which is applicable to most variable speed pump stations in the HRSD system. Flomatcher pump controllers are variable speed but do not have a remote speed indication. For pumps with remote speed indications, HRSD used pump affinity laws to draw pump curves in 10% increments for each plot. These curves are useful for interpretation as a pump operating at a speed less than 100% would be expected to operate on a performance curve less than the 100% performance curve.

#### 3.3.2.2 Process for Analysis

HRSD selected a date range for the pump performance data that allowed for a scatter to be plotted over the manufacturer's pump performance curve. From the selected data range, HRSD analyzed a characteristic point which was assumed to be the condition under which the pump is operating most of the time. The characteristic point is the data point most near the calculated TDH and flow average over the date range. For variable speed pumps, a characteristic point was selected from amongst the highest recorded speed range whenever practicable. The characteristic point can be seen in Section 6 for each pump and is labeled as "Measured Point."

### 3.3.3 Draw down results

HRSD plotted the results of both the field draw down tests and desktop analysis on the manufacturer's pump performance curve. Those plots also contain the best efficiency point (BEP) and design operating point (DOP) from the manufacturer's curve.

The results of the draw down tests serve as a guide for HRSD to perform further investigations on pumps that appear to have anomalies that may be indications of excessive wear.

## Section 4

# Assets Presenting Material Risk of Failure

The purpose of the Condition Assessment Program was to identify assets presenting a material risk of failure. HRSD has identified pumping facility assets presenting material risk of failure from the results of the various condition assessment activities and referred them for action. The referral for action is one of three potential options which are listed below.

- A Rehab Project Number, which is associated with a project in the Rehab Plan
- “Interim System Improvements”, which are the specific projects identified in the Consent Decree and are not part of the Rehab Plan
- “Prompt Repair”, which means that the asset will be addressed (or work is currently being performed) under the Prompt Repair Program.

Rehab Project Numbers give information on the treatment plant tributary area and identify themselves as part of the Rehab Plan. For example, a Rehab Project numbered “AT-R1” is within the Atlantic TP service area (“AT”), is a Rehab Project (“R”) and is numbered sequentially (“1”) according to when the project was developed with respect to the other Rehab Action Plan projects. The sequential number does not reflect the project priority or any other project characteristics other than the sequence of development relative to the other projects.

Defects not presenting a material risk of failure are referred to the normal maintenance program.

A complete list of pumping facility assets presenting material risk of failure and included in the Rehabilitation Action Plan can be found in Table B-10 at the end of Section 5.

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**Section 5**

**Final Condition Assessment Report  
Tables**

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**Table B-5. HRSD Pumping Facilities**

PS Number	PS Name	Address	Treatment Plant	Major Inspection Dates		
				Initial Inspection	Update Inspection	Electrical / Lightning Strike Inspection
101	Arctic Avenue	2814 Arctic Ave, Virginia Beach	Atlantic Treatment Plant	6/27/2008	6/23/2011	7/21/2011
102	Ashland Circle	1402 Ashland Circle, Norfolk	Virginia Initiative Treatment Plant	6/22/2008	6/23/2011	7/5/2011
103	Bainbridge Blvd	801 Bainbridge Blvd, Norfolk	Virginia Initiative Treatment Plant	6/26/2008	6/10/2011	6/23/2011
104	Cedar Lane	5915 Cedar Lane, Portsmouth	Nansemond Treatment Plant	7/2/2008	6/8/2011	7/20/2011
105	Chesapeake Blvd	5734 Chesapeake Blvd, Norfolk	Virginia Initiative Treatment Plant	6/22/2008	6/22/2011	7/19/2011
106	City Park	Ft of La Vallette Avenue, Norfolk	Virginia Initiative Treatment Plant	6/23/2008	6/23/2011	7/8/2011
107	Colley Avenue	715 Fairfax Avenue, Norfolk	Virginia Initiative Treatment Plant	6/19/2008	6/21/2011	6/23/2011
108	Dovercourt Road	948 Dovercourt Road, Norfolk	Army Base Treatment Plant	6/19/2008	6/22/2011	7/19/2011
109	Dozier's Corner	1121 Keats Street, Norfolk	Atlantic Treatment Plant	6/26/2008	6/9/2011	7/8/2011
110	Ferebee Avenue	2812 Bainbridge Blvd, Chesapeake	Virginia Initiative Treatment Plant	6/26/2008	6/10/2011	7/8/2011
111	Granby Street	4244 Granby Street, Norfolk	Virginia Initiative Treatment Plant	6/22/2008	6/23/2011	7/7/2011
112	Independence Blvd	4562 Southern Blvd, Virginia Beach	Chesapeake-Elizabeth Treatment Plant	7/1/2008	6/23/2011	7/21/2011
113	Luxembourg Avenue	3030 Luxembourg Avenue, Norfolk	Virginia Initiative Treatment Plant	6/22/2008	6/22/2011	7/5/2011
114	Monroe Place	5808 Monroe Place, Norfolk	Virginia Initiative Treatment Plant	6/23/2008	6/21/2011	6/24/2011
115	Newtown Road	115 Newtown Road, Norfolk	Chesapeake-Elizabeth Treatment Plant	6/27/2008	6/23/2011	7/19/2011
116	Norchester Street	935 Norchester Street, Norfolk	Virginia Initiative Treatment Plant	6/25/2008	6/21/2011	7/18/2011
117	North Shore Road	1510 1/2 North Shore Road, Norfolk	Army Base Treatment Plant	6/23/2008	6/21/2011	6/23/2011
118	Norview Avenue	869 Norview Avenue, Norfolk	Virginia Initiative Treatment Plant	6/22/2008	6/22/2011	7/19/2011
119	Park Avenue	503 Park Avenue, Chesapeake	Virginia Initiative Treatment Plant	6/26/2008	6/10/2011	7/20/2011
120	Pine Tree	2924 Virginia Beach Blvd, Virginia Beach	Atlantic Treatment Plant	7/1/2008	6/23/2011	7/21/2011
121	Plume Street	236 E. Plume Street, Norfolk	Virginia Initiative Treatment Plant	6/23/2008	6/20/2011	7/18/2011
122	Powhatan Avenue	1548 Buckingham Avenue, Norfolk	Virginia Initiative Treatment Plant	6/23/2008	6/21/2011	6/24/2011
123	Quail Avenue	800 Quail Avenue, Chesapeake	Atlantic Treatment Plant	6/25/2008	6/20/2011	7/20/2011
124	Richmond Crescent	128 Richmond Crescent, Norfolk	Virginia Initiative Treatment Plant	6/23/2008	6/21/2011	6/24/2011
125	Seay Avenue	3541 Seay Avenue, Norfolk	Virginia Initiative Treatment Plant	6/25/2008	6/20/2011	6/22/2011

Table B-5. HRSD Pumping Facilities

PS Number	PS Name	Address	Treatment Plant	Major Inspection Dates		
				Initial Inspection	Update Inspection	Electrical / Lightning Strike Inspection
127	State Street	351 Emmett Place, Norfolk	Virginia Initiative Treatment Plant	6/26/2008	6/10/2011	7/18/2011
128	Steamboat Creek	1900 E. Indian River Road, Chesapeake	Atlantic Treatment Plant	6/26/2008	6/10/2011	6/22/2011
129	Taussig Blvd	2017 Taussig Blvd, Norfolk	Army Base Treatment Plant	6/23/2008	6/22/2011	7/19/2011
130	Virginia Beach Blvd	3514 E. Virginia Beach Blvd, Norfolk	Virginia Initiative Treatment Plant	6/25/2008	6/21/2011	6/24/2011
131	Washington Plant	1728 Great Bridge Blvd, Chesapeake	Atlantic Treatment Plant	6/26/2008	6/9/2011	7/8/2011
132	Willoughby Avenue	1912 Willoughby Avenue, Norfolk	Virginia Initiative Treatment Plant	6/25/2008	6/10/2011	6/23/2011
133	Providence Road	5729 Old Providence Road, Virginia Beach	Atlantic Treatment Plant	7/1/2008	6/24/2011	7/22/2011
134	Pughsville Road	4725 Shoulders Hill Road, Suffolk	Nansemond Treatment Plant	7/2/2008	6/7/2011	7/7/2011
135	Suffolk	1136 Sanders Drive, Suffolk	Nansemond Treatment Plant	7/3/2008	6/7/2011	7/7/2011
137	Bowers Hill	3588 South Military Hwy, Chesapeake	Nansemond Treatment Plant	7/3/2008	6/7/2011	7/8/2011
138	Deep Creek	1221 Shell Road, Chesapeake	Nansemond Treatment Plant	7/3/2008	6/9/2011	7/8/2011
139	Quail Avenue PRS	822 Quail Avenue, Chesapeake	Atlantic Treatment Plant	6/25/2008	6/20/2011	7/20/2011
140	Atlantic Avenue	1085 Old Dam Neck Road, Virginia Beach	Atlantic Treatment Plant	7/1/2008	6/24/2011	7/20/2011
141	Hanover Avenue	900 Hanover Avenue, Norfolk	Virginia Initiative Treatment Plant	6/23/2008	6/21/2011	6/23/2011
142	Jamestown Crescent	858 Jamestown Crescent, Norfolk	Virginia Initiative Treatment Plant	6/23/2008	6/21/2011	6/23/2011
143	Shipp's Comer	1423 London Bridge Blvd, Virginia Beach	Atlantic Treatment Plant	7/1/2008	6/24/2011	7/21/2011
144	Elmhurst Lane	600 Elmhurst Lane, Portsmouth	Virginia Initiative Treatment Plant	7/2/2008	6/8/2011	7/7/2011
145	Rodman Avenue	2412 Rodman Avenue, Portsmouth	Virginia Initiative Treatment Plant	7/2/2008	6/8/2011	7/22/2011
146	Camden Avenue	2203 Camden Ave., Portsmouth	Virginia Initiative Treatment Plant	7/2/2008	6/8/2011	7/22/2011
147	Chesterfield Blvd	2731 Chesterfield Blvd, Norfolk	Virginia Initiative Treatment Plant	6/19/2008	6/20/2011	6/22/2011
148	Ingleside Road	600 Ingleside Road, Norfolk	Virginia Initiative Treatment Plant	6/25/2008	6/20/2011	6/21/2011
151	Kempsville Road	4765 Ferrell Parkway, Virginia Beach	Atlantic Treatment Plant	7/1/2008	6/24/2011	7/21/2011
152	Terminal Blvd	7808 Newport Avenue, Norfolk	Army Base Treatment Plant	6/23/2008	6/22/2011	7/19/2011
153	Laskin Road	590 Fremac Avenue, Virginia Beach	Atlantic Treatment Plant	6/19/2008	6/24/2011	7/21/2011
154	RT 337	2472 Gum Road, Chesapeake	Nansemond Treatment Plant	7/2/2008	6/9/2011	7/7/2011



**Table B-5. HRSD Pumping Facilities**

PS Number	PS Name	Address	Treatment Plant	Major Inspection Dates		
				Initial Inspection	Update Inspection	Electrical / Lightning Strike Inspection
201	25th Street	11 25th Street, Newport News	Boat Harbor Treatment Plant	6/27/2008	6/16/2011	8/16/2011
202	33rd Street	85 33rd Street, Newport News	Boat Harbor Treatment Plant	6/27/2008	6/16/2011	8/16/2011
203	Bay Shore	720 Bay Shore Lane, Hampton	Boat Harbor Treatment Plant	6/25/2008	6/27/2011	8/3/2011
204	Bloxoms Corner	5 Beach Rd, Hampton	York River Treatment Plant	6/25/2008	6/27/2011	8/3/2011
205	Big Bethel PRS	1431 Big Bethel Rd, Hampton	York River Treatment Plant	6/20/2008	6/27/2011	8/10/2011
206	Bridge St	4701 Victoria Blvd, Hampton	Boat Harbor Treatment Plant	6/26/2008	6/27/2011	8/3/2011
207	Center Ave	315 Center Ave, Newport News	James River Treatment Plant	6/30/2008	6/16/2011	8/4/2011
208	Claremont	1210 Chesapeake Ave, Hampton	Boat Harbor Treatment Plant	6/26/2008	6/17/2011	8/16/2011
209	Copeland Park	4401 City Line Rd, Newport News	Boat Harbor Treatment Plant	6/26/2008	6/17/2011	8/15/2011
210	Ferguson Park	227 75th Street, Newport News	Boat Harbor Treatment Plant	6/30/2008	6/16/2011	8/4/2011
211	Hampton Institute (University)	54 Shore Drive, Hampton	Boat Harbor Treatment Plant	6/26/2008	6/17/2011	8/3/2011
212	Hilton School	223 River Rd, Newport News	James River Treatment Plant	6/30/2008	6/16/2011	8/1/2011
213	Jefferson Ave	BHTP, Newport News	Boat Harbor Treatment Plant	6/27/2008	6/16/2011	8/16/2011
214	Kingsmill	7851 Pocahontas Trl, Williamsburg	Williamsburg Treatment Plant	7/1/2008	6/15/2011	8/2/2011
215	Lee Hall PRS	17388 Warwick Blvd, Newport News	James River Treatment Plant	7/2/2008	6/15/2011	8/4/2011
216	Lucas Creek	750 Lucas Creek Road, Newport News	James River Treatment Plant	6/30/2008	6/15/2011	8/1/2011
217	Langley Circle	4 Thornrose Ave, Hampton	York River Treatment Plant	6/26/2008	6/27/2011	8/3/2011
218	Morrison	1228 Gatewood Rd, Newport News	James River Treatment Plant	6/30/2008	6/16/2011	8/1/2011
219	Newmarket	6000 Orcutt Ave, Newport News	Boat Harbor Treatment Plant	6/27/2008	6/17/2011	8/15/2011
220	Normandy Lane	116 Normandy Lane, Newport News	James River Treatment Plant	6/20/2008	6/16/2011	8/1/2011
221	Patrick Henry	215 G Avenue, Newport News	James River Treatment Plant	6/20/2008	6/15/2011	8/1/2011
223	Washington Street	217 Washington St, Hampton	Boat Harbor Treatment Plant	6/26/2008	6/17/2011	8/3/2011
224	Woodland Road	11 McElheney Lane, Hampton	York River Treatment Plant	6/25/2008	6/27/2011	8/3/2011
225	Willard Ave	219 National Ave, Hampton	Boat Harbor Treatment Plant	6/26/2008	6/27/2011	8/3/2011

Table B-5. HRSD Pumping Facilities						
PS Number	PS Name	Address	Treatment Plant	Major Inspection Dates		
				Initial Inspection	Update Inspection	Electrical / Lightning Strike Inspection
226	Williamsburg	540 South England Street, Williamsburg	Williamsburg Treatment Plant	7/1/2008	6/13/2011	8/2/2011
227	Fort Eustis	1619 Taylor Ave, Newport News	Williamsburg Treatment Plant	7/2/2008	6/15/2011	8/15/2011
229	Colonial Williamsburg	1000 State Route 132, York Co	Williamsburg Treatment Plant	7/1/2008	6/13/2011	8/2/2011
230	Rolling Hills	414 Rolling Hills Dr, York Co	Williamsburg Treatment Plant	7/1/2008	6/15/2011	8/4/2011
231	Ford's Colony	430 Hempstead Road, Williamsburg	Williamsburg Treatment Plant	7/1/2008	6/13/2011	8/2/2011
232	Greensprings	3900 John Tyler Mem. Hwy, Williamsburg	Williamsburg Treatment Plant	7/1/2008	6/13/2011	8/2/2011
233	Lodge Road	202 Lodge Road, York County	Williamsburg Treatment Plant	Not inspected in 2008. Recently acquired by HRSD	6/15/2011	8/2/2011

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
<b>NORTH SHORE</b>						
201	25th Street	1	2009-T-101749	12/14/2008	1,100	Blockage in line caused manhole beside pump station to overflow. Pumps at the station were operating normally.
203	Bay Shore	7	SR99-17	9/10/1999	16,800	l/l. Very wet period followed by 2.95" of rain in 22 hours.
			SR99-32	9/15/1999	37,425	Hurricane Floyd. 13.44" of rain @ Pine Chapel PS 9/15-16.
			SR99-73	10/17/1999	16,650	Hurricane Irene.
			SR00-24	7/24/2000	48,200	3.99" of rain @ Bay Shore Lane PS.
			2004-T-0538	9/18/2003	-1	Hurricane Isabel. Widespread flooding and power outages.
			2011-T-102697	9/30/2010	48,900	Two manholes beside the station overflowed due to high flows caused by remnants of TS Nicole interacting with low pressure system. Manhole beside station overflowing at initial estimated rate of 20 gpm. Manhole across the street overflowing at initial estimated rate of 15 gpm. Rain gauge at Bayshore Station recorded 12.42" of rainfall during 48-hour period with 10" of rain received on 9/30.
			2013-T-103570	10/30/2012	-1	Heavy rains and tidal flooding from hurricane Sandy caused pump station to overflow at manhole outside of station. The station was checked numerous times on October 29 but no overflow was observed as the area was flooded. When the station was checked again on October 30, the flood waters had receded and staff found manhole cover was dislodged and there was evidence of a spill. Rain gauge at station recorded 6.72" of rain during October 28-29.
204	Bloxoms Corner	2	2004-T-0539	9/18/2003	-1	Hurricane Isabel. PS lost both power feeds. Widespread flooding.
			2013-T-103720	5/17/2013	188	Crew was switching out a hose for 4-inch Godwin pump when the pump unexpectedly started.
205	Big Bethel PRS	1	2005-T-100003	10/14/2004	300	Personnel were repairing a valve at the pump station and had installed bypass pumping around the station. The coupling in the 12-inch suction hose came unhooked and caused the bypass hose to discharge into the storm drain.
206	Bridge Street	26	SR99-1	3/15/1999	1,900	Failure in control system caused all pumps to trip out.
			SR99-22	9/10/1999	19,500	l/l. Very wet period followed by 2.95" of rain in 22 hours.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			SR99-30	9/15/1999	336,600	Hurricane Floyd. 13.44" of rain @ Pine Chapel PS 9/15-16.
			SR99-60	10/17/1999	210,625	Hurricane Irene
			SR00-21	7/24/2000	75,400	5.60" of rain @ Pine Chapel PS (July hist. avg. 5.53")
			SR00-31	8/23/2000	1,550	Pumps wouldn't start automatically due to failed processor in PLC
			SR00-32	8/25/2000	15,000	3.26" of rain @ Pine Chapel PS in 2 hours; 3.45" for the day
			SR00-33	9/3/2000	23,900	2.44" of rain at Pine Chapel PS 9/2-9/3. 3rd wettest summer in 130 yrs
			2003-T-1473	2/16/2002	-1	2.64" rain 2/15-2/17. High water alarm. No evidence of overflow.
			2003-T-1474	2/17/2003	-1	2.64" rain 2/15-2/17. High water alarm. No evidence of overflow.
			2004-T-0271	8/8/2003	1,900	1.52" in 90-min on 8/8. 4.89" Aug 4-8
			2004-T-0536	9/18/2003	-1	Hurricane Isabel. Widespread flooding.
			2005-T-0365	8/14/2004	280,340	TS Charley. 6.17" 8/12-8/16. 5.10" 8/14-8/15.
			2006-T-100347	10/8/2005	4,965	Heavy rainfall created excessive I/I. Estimated flow rate of 15 gpm discharging from tide gate.
			2006-T-100679	6/27/2006	190,400	Refer to SSOR 100678. Pump station was shut down in order to reduce flow at force main break on 3721 Victoria Blvd so that repairs could be made. PS has tidal gate which discharges overflow to river.
			2006-T-100680	6/28/2006	2,200	Mechanical problems with a by-pass pump caused the system to backup and by-pass at the Bridge St. Tide Gate for 1 hour and 50 minutes at 20 gpm.
			2007-T-100929	10/7/2006	-1	Heavy rainfall and flooding in area created excessive I/I.
			2007-T-100983	11/22/2006	-1	Heavy rains and high winds from coastal storm flooded the area, creating excessive I/I.
			2011-T-102642	7/29/2010	12,600	Heavy rain from storms caused pump station to overflow. All three pumps tripped out due to high temperatures. Rain gauge at Bayshore PS recorded 3.3" of rain in two hours.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2011-T-102694	9/30/2010	665,400	Pump station overflowed via tide gate due to high flows caused by remnants of TS Nicole interacting with low pressure system. Rain gauge at Freeman Pump Station recorded 16.23" of rainfall during 48-hour period with 13.85" of rain received on 9/30.
			2012-T-103114	7/9/2011	-1	Heavy rain caused pump station to overflow through tide gate. Rain gauge at Freeman PS recorded 2.26" of rain between 1:00 and 2:30 am.
			2012-T-103125	7/25/2011	-1	Heavy rain caused pump station to overflow at tide gate. Rain gauge at Copeland Park PS recorded 4.86" from 8:00 to 11:00 pm with 4.46" of rain received within the first hour.
			2012-T-103196	8/27/2011	-1	Heavy rains from hurricane Irene caused station to overflow through tidal gate. Rain gauge at Freeman Ps recorded 10.43" of rain for 8/27.
			2013-T-103509	8/29/2012	-1	Heavy rain from severe storm caused pump station to overflow at tide gate. Rain gauge at Bayshore Pump Station recorded 3.8" of rain within 4 hours. Freeman Pump Station rain gauge recorded 6.9" of rain in 4.5 hours.
			2013-T-103568	10/30/2012	-1	Heavy rain and tidal flooding from hurricane Sandy caused pump station to overflow at tide gate. Rain gauge at Bayshore Pump Station recorded 6.72" of rain during October 28-29 with 4.42" of rain falling on October 29.
			2013-T-103661	2/8/2013	-1	Heavy rain caused pump station to overflow at tide gate into Hampton River. Rain gauge at Bridge Street Pump Station recorded 2.4 inches of rain within sixteen hours.
207	Center Avenue	46	SR99-15	9/4/1999	9,750	I/I. Tropical Storm Dennis. 5.13 inches of rain in 24 hours.
			SR99-16	9/5/1999	1,800	I/I. Tropical Storm Dennis. 5.13 inches of rain in 24 hours.
			SR99-20	9/10/1999	1,175	I/I. Very wet period followed by 2.90" of rain in 22 hours.
			SR99-29	9/15/1999	490,300	Hurricane Floyd. 19.32" of rain @ Morrison PS 9/15-16.
			SR99-69	10/17/1999	39,875	Hurricane Irene
			SR00-1	1/30/2000	20,400	Snowmelt combined with 1.27" of rain.
			SR00-9	3/21/2000	1,535	Intense rainfall. 1.48" on 3/21. 1.31" in 5 hours prior to event

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			SR00-15	4/17/2000	2,840	1.20" of rain at Morrison PS, 1.04" in 5 hours prior to event
			SR00-21	7/24/2000	39,000	5.60" of rain @ Pine Chapel PS (July hist. avg. 5.53")
			SR01-06	6/16/2001	8,770	TS Allison, 2.57" rain @ Bay Shore PS, 2.39" in 5 hrs prior to event
			SR01-09	7/29/2001	810	3.26" of rain in 10 hours. 3.41" on that day.
			SR01-10	8/18/2001	3,825	2.58" of rain in 2 hours, 3.24" for the day
			2003-T-1943	4/7/2003	8,250	2.29" of rain on 4/7. 3 manholes overflowed.
			2003-T-1963	4/9/2003	30,470	2.29" of rain on 4/7
			2003-T-2016	4/10/2003	4,420	2.29" of rain on 4/7 & 1.99" of rain on 4/9
			2004-T-0247	8/7/2003	2,200	2.07" of rain in 5 hrs on 8/7 (0.96" in 30-min); 5.01" Aug 5-7
			2004-T-0270	8/8/2003	2,790	6.29" Aug 5-8 (1.03" in 1-hr period before event)
			2004-T-0287	8/11/2003	830	7.53" Aug 2-11; 0.72" in 90-min 8/11
			2004-T-0487	9/12/2003	1,365	2.45" of rain on 9/12.
			2004-T-0537	9/18/2003	-1	Hurricane Isabel. Widespread flooding.
			2004-T-0939	10/29/2003	560	Upstream Gravity Line (NG-104). 2.90" of rain in 16-hr period prior to event.
			2004-T-1228	12/14/2003	20,250	Upstream Gravity Line (NG-104). 1.63" of rain on 12/14, 1.34" in 7 hours.
			2005-T-0034	7/7/2004	5,700	Upstream Gravity Line (NG-104). 1.82" on 7/7. 1.52" in 30 minutes.
			2005-T-0366	8/14/2004	233,675	Upstream Gravity Line (NG-104). TS Charley. 7.46" 8/12-8/16. 6.57" 8/14-8/15.
			2006-T-100349	10/8/2005	5,100	Upstream Gravity Line (NG-104). Heavy rainfall (6.05 inches recorded at nearest rain gauge) created excessive I/I. Manhole overflowed at an estimated rate of 50 gpm with 70 % (3570 gal) stormwater and 30 % (1530 gal) wastewater.
			2006-T-100348	10/8/2005	8,670	Heavy rainfall and localized flooding created excessive I/I. Manhole behind pump station overflowed at an estimated rate of 85 gpm. 70% (6069 gal) was stormwater and 30% (2601 gal) was wastewater.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2006-T-100647	6/14/2006	850	Area received several inches of rain from remnants of TS Alberto which created excessive I/I. Manhole located behind pump station overflowed due to system being overloaded.
			2006-T-100676	6/23/2006	3,600	Torrential rains created excessive I/I causing manhole at pump station to overflow.
			2007-T-100780	9/1/2006	14,235	Heavy rainfall from TS Ernesto created excessive I/I. Weather gauges located at HRSD pump stations recorded daily rainfall totals ranging from 7 to 9.8 inches with majority occurring within 8-hour period.
			2007-T-100930	10/7/2006	59,800	Heavy rainfall and flooding created excessive I/I. Typical dry weather flow at PS is 400 gpm. 2400 gpm flow rate was recorded during storm.
			2007-T-100964	11/12/2006	16,840	Area received large amount of rainfall which created excessive I/I.
			2007-T-100984	11/22/2006	14,370	Heavy rainfall and high winds from coastal storm created excessive I/I.
			2007-T-101068	12/25/2006	2,700	Pump station overflowed intermittently due to heavy rain and excessive I & I. Nearby rain gauge measured 1.26" of rain in 12 hour period.
			2011-T-102643	7/29/2010	16,650	Heavy rains from storms in area caused pump station to overflow. Rain gauge at Copeland Park PS recorded 5.83" of rain in two hours.
			2011-T-102696	9/30/2010	1,301,187	Pump Station overflowed due to high flows caused by remnants of TS Nicole interacting with low pressure system. Rain gauge at Copeland Park Pump Station recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received on 9/30. Initial flow rate of 178 gpm.
			2012-T-103096	7/6/2011	14,260	Heavy rain caused high flows at pump station. Rain gauge at Morrison PS recorded 1.49" of rain from 6:15 to 6:45 pm. During the rain event, the temporary pump failed at the station. Responded to site and found the pump in alarm condition but no fail code was displayed on the panel. All other pumps were operating at the time.
			2012-T-103116	7/9/2011	216,660	Heavy rain caused high flows at pump station. Rain gauge at Morrison PS recorded 3.18" of rain from 11:15 pm 7/8 to 2:15 am on 7/9 with 1.25" being received within 30 minutes.
			2012-T-103195	8/27/2011	-1	Heavy rain from hurricane Irene caused station to overflow. Rain gauge at Copeland Park Pump Station recorded 8.71" of rain for 8/27.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2012-T-103397	5/16/2012	201,908	Heavy rain from storms in the area caused pump station to overflow at the weir structure beside the station. Rain gauge at Morrison Avenue Pump Station recorded 3.79" of rain within one hour.
			2012-T-103406	6/2/2012	360,972	Severe storms in area increased flows and the station overflowed at the weir. Rain gauge at Morrison Pump Station recorded a total of 4.95" of rainfall. The area received multiple downpours where the rain gauge measured close to or over 0.5" of rainfall within 15 minutes.
			2013-T-103453	8/12/2012	353,508	High flows from rain storms caused station to overflow at weir structure outside station. Rain gauge at Morrison Pump Station recorded 2.09" of rain in two hours.
			2013-T-103459	8/25/2012	1,053,571	Storms with heavy rain caused station to overflow. Rain gauge at Morrison Pump Station recorded 6.15" of rainfall from 5:30 am to 7:15 am. A total of 7.63" of rain was recorded for a 9-hour period.
			2013-T-103484	8/27/2012	190,282	Pump station overflowed at the weir structure due to high flows from rainfall. Rain gauge at Morrison Pump Station recorded 1.24" of rainfall in two and a half hours. This was in addition to the large amount of rain received on August 25. Rain gauge at Morrison recorded a total of 9.16" of rainfall from August 25 5:30 am to August 26 6:30 pm.
			2013-T-103497	8/29/2012	657,953	Heavy rain from severe storm caused pump station to overflow at the weir structure outside of station. The rain gauge at Copeland Park Pump Station recorded 7.21" of rain in 5.5 hours.
			2013-T-103547	10/29/2012	355,786	High flows from hurricane Sandy caused pump station to overflow at weir structure. Rain gauge at Morrison Pump Station recorded 7.17" of rain during October 28-29.
			2013-T103660	2/8/2013	19,628	Heavy rain caused pump station to overflow at weir structure outside of station. The rain gauge at Hilton School Pump Station recorded 2.46" of rain within sixteen hours.
208	Claremont Avenue	1	2006-T-100346	10/8/2005	-1	Heavy rainfall (6.05 inches recorded at nearest rain gauge) created excessive I/I. High water alarm at pump station alerted staff. May have been a spill with a 50/50 mix of stormwater and wastewater.
210	Ferguson Park	4	SR99-2	4/25/1999	450	Human error. Air compressor left unplugged.
			2004-T-0668	9/23/2003	1,000	Lost permanent power during heavy wind. Load did not transfer.



Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2008-T-101439	3/3/2008	250	City line had blockage. When the blockage was cleared, flow surged to pump station. The lead pump was not operating and the lag pump was operating but not pumping. This caused overflows at the manhole at the pump station site and the Leeward Marina restrooms.
			2012-T-103327	12/21/2011	250	Partial blockage of gravity line caused manhole beside pump station to overflow. HRSD was notified that floor drains at Leeward Marina were backing up with sewage. HRSD responded and the pump station was operating properly but the gravity line between the station wet well and the manhole was partially blocked. The manhole overflowed intermittently for ten minutes.
211	Hampton University	4	SR99-49	9/16/1999	8,400	Hurricane Floyd. 13.44" of rain @ Pine Chapel PS 9/15-16.
			2004-T-0667	9/23/2003	3,500	Possible line or valve failure. Section isolated. NS Ops to excavate.
			2012-T-103208	8/27/2011	-1	Heavy rain and high tides from hurricane Irene caused station to overflow. Rain gauge at Freeman Avenue PS recorded 10.43" of rain for 8/27.
			2014-T-103811	9/4/2013	19,550	Failure of 12-inch cast iron discharge force main at pump station.
212	Hilton School	6	SR99-45	9/15/1999	37,500	Hurricane Floyd. 19.32" of rain @ Morrison PS 9/15-16.
			2005-T-0362	8/14/2004	930	TS Charley. 3.59" 8/14. 8.49" 8/1-8/16. Area flooding.
			2007-T-101084	1/5/2007	120	Cast iron force main failed due to ground settling. Additional 30 gallons lost during pump and haul operation.
			2013-T-103452	8/11/2012	1,590	High flows from rain storms caused manhole outside of station to overflow. Rain gauge at Hampton PS154 recorded 2.63" of rain in two hours with a total of 3.22" recorded over an eight-hour period.
			2013-T-103460	8/25/2012	16,600	Storms with heavy rain cause station wet well and manhole to overflow. Rain gauge at Morrison Pump Station recorded 6:15" of rainfall from 5:30 am to 7:15 am. A total of 7.63" of rain was recorded during a 9-hour period.
			2013-T-103498	8/28/2012	4,920	Heavy rain from severe storm caused pump station to overflow from both the wetwell and the manhole outside the station. The rain gauge at Copeland Park Pump Station recorded 7.21" of rain within 5.5 hours.

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Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
214	Kingsmill	6	SR99-8	7/21/1999	4,500	Failure in 32-ft stick adjacent to Sep 98 replacement of 16-ft stick
			2003-T-0725	10/15/2002	1,800	Corroded emerg. pump connection. Spill from brewery's overflow pond.
			2003-T-2299	5/27/2003	3,000	Crew cut unmarked power line to Dominion Power Transformer
			2006-T-100674	6/23/2006	21,000	Heavy rains in area created excessive I/I. Pump station overflows into retention pond with sluice gate that enters tunnel under road and goes to ditch.
			2007-T-100706	8/1/2006	2,100	Pump at station burned up and caused power failure at station. Overflow from station entered stormwater pond where most of it was contained.
			2007-T-100932	10/7/2006	-1	Heavy rainfall and flooding created excessive I/I. Typical PS flow rate is 2500 gpm on dry day. Flow rate increased to 6800 gpm during the storm.
216	Lucas Creek PRS	1	2007-T-101196	5/7/2007	700	Bubbler system at station malfunctioned causing wet well level to increase and overflow. Neighbor noticed problem and contacted HRSD.
217	Langley Circle	3	SR99-41	9/15/1999	2,835	Hurricane Floyd. 13.44" of rain @ Pine Chapel PS 9/15-16.
			SR00-23	7/24/2000	39,900	5.60" of rain @ Pine Chapel PS (July hist. avg. 5.53")
			2005-T-0364	8/14/2004	174,315	TS Charley. 7.72" 8/12-8/16. 7.00" 8/14-8/15.
219	Newmarket Creek	3	SR99-50	9/16/1999	40,700	Hurricane Floyd. 19.32" of rain @ Morrison PS 9/15-16.
			2006-T-100548	3/16/2006	150	Drain hose inside of an 8" bypass pump set up at the pump station came apart.
			2012-T-103209	8/27/2011	-1	Heavy rain and emergency generator failure during hurricane Irene caused overflow at station. Electricians responded to alarm and found power was off to the station and generator was not operating. Rain gauge at Copeland Park PS recorded 8.71" of rain for 8/27.
221	Patrick Henry	10	SR99-52	9/16/1999	13,100	Hurricane Floyd. 14.29" of rain @ Big Bethel PRS 9/15-16.
			SR00-18	7/24/2000	38,700	5.81" of rain at Lucas Creek PS (July hist avg. 5.53")
			2004-T-1502	2/7/2004	300	Mechanical failure - suspected debris in bubbler control line.
			2005-T-100207	2/25/2005	50	Bubbler system in pump station became clogged with sand. Pumps failed to operate when wet well level rose and minor spill occurred.

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Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2005-T-100290	6/18/2005	50	Control panel in pump station failed which caused wet well level to rise.
			2006-T-100621	6/2/2006	-1	Metal coupling separated from rubber flex hose on 8" temporary by-pass pumping system discharging sewage to storm drain ditch.
			2006-T-100677	6/23/2006	100	Torrential rainfall created excessive I/I causing manhole beside pump station to overflow into ditch.
			2007-T-100784	9/1/2006	-1	Heavy rainfall from TS Ernesto created excessive I/I and flooding in the area. Weather gauges located at HRSD pump stations recorded daily rainfall totals ranging from 7 to 9.8 inches with majority occurring during 8-hour period.
			2012-T-103115	7/9/2011	-1	Heavy rain caused overflow at pump station influent flume. Rain gauge at Lucas Creek PS recorded 2.65" of rain from 11:15 pm 7/8 to 1:15 am 7/9.
			2013-T-103461	8/25/2012	-1	Storms with heavy rain caused pump station to overflow at flume outside of station. Rain gauge at Lucas Creek Pump Station recorded 5.32" of rain from 5:30 am to 8:00 am. A total of 6.39" of rain was recorded for an 8-hour period.
222	Pine Chapel	1	SR99-53	9/16/1999	5,100	Hurricane Floyd. 13.44" of rain @ Pine Chapel PS 9/15-16.
226	Williamsburg	15	SR99-10	7/28/1999	300	Air vent valve broke when a stab meter was being removed.
			SR99-12	8/20/1999	550	I/I. 2.38 inches of rain in one hour prior to event.
			2005-T-0497	8/30/2004	2,600	WBTP generator failed. PCV controller locked up.
			2005-T-100087	12/10/2004	60	Lightning struck the control valve in the force main leading to the plant. The valve froze in position at 40% open. The partially closed valve and the excessive I/I from the thunderstorm caused flow to back up and overflow the pump station wet well.
			2006-T-100513	2/9/2006	4,500	Failure of force main at the pump station. Leaking at approximately 25 gpm.
			2007-T-100785	9/1/2006	4,630	Heavy rainfall from TS Ernesto created excessive I/I. Weather gauge located at Williamsburg PS recorded 8.93 inches of rain for the day with majority occurring from 0500 to 1300.
			2007-T-101176	4/16/2007	-1	PLC failure stopped the working pump and did not start the lag pump. Small hole leaked sewerage onto floor and out door. Spill stopped at 1139 AM. Duration of problem was 5 minutes at rate of 5 gpm.

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Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2008-T-101585	6/19/2008	50	There was a crack in a fitting for the bubbler line at the pump station which caused air to escape the bubbler system which monitors the wet well level. The bubbler failure gave a false reading to the controller so that it did not signal the pump to speed up as the wet well level rose. The wet well overflowed briefly.
			2012-T-103117	7/9/2011	-1	Heavy rain caused overflow at station wet well. Rain gauge at Greensprings PS recorded 5.09" of rain from 9:30 pm 7/8 to 12:30 am 7/9.
			2012-T-103210	8/27/2011	-1	Heavy rain and failure of all pumps at the station during hurricane Irene caused overflow at station. Rain gauge at station recorded 9.38" of rain during 8/27.
			2013-T-103429	7/20/2012	45,850	Heavy rain due to storm in area produced high flows which caused wetwell at station to overflow. Rain gauge recorded 3.97" of rain in 3.25 hours.
			2013-T-103546	10/29/2012	4,325	Heavy rain from hurricane Sandy caused pump station wet well to overflow at estimated rate of 25 gpm. Rain gauge at station recorded 5.11" of rain during October 28-29.
			2013-T-103727	5/23/2013	183,156	Area received storms with heavy rainfall. Flows increased and caused station wet well to overflow. Rain gauge at station recorded 4.17" of rain within 5 hours.
			2013-T-103755	6/7/2013	382,000	Pump Station overflowed briefly from 10:56 am to 11:16 am due to high flows caused by rainfall from Tropical Storm Andrea. Pump station started overflowing again at 4:47 pm as rainfall increased. Station cleared at 11:08 pm. Rain gauge at pump station recorded 9.55" of rainfall in less than 24 hours.
			2013-T-103780	6/13/2013	97,500	Rain and high winds from a severe storm in the area caused power outages in service area which increased pressures in the interceptor system and overflowed station wet well.
227	Fort Eustis	1	2011-T-102726	9/30/2010	22,950	Manhole at pump station overflowed due to high flows caused by remnants of TS Nicole interacting with low pressure system. Rain gauge at Fort Eustis Pump Station recorded 8.56" of rainfall during 48-hour period with 5.91" of rain received on 9/30. Initial estimated flow rate of 150 gpm.
231	Fords Colony	3	2008-T-101384	12/31/2007	-1	Station checker found 8-inch emergency pipe had blown off of its connection at pump station. An underground coupling failed which allowed the connection to come apart. The duration of the failure is unknown.

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Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2011-T-102725	9/30/2010	39,050	Manhole beside the station overflowed due to high flows caused by remnants of TS Nicole interacting with low pressure system. Rain gauge at fords Colony Station recorded 10.48" of rainfall during 48-hour period with 7.08" of rain received on 9/30.
			2012-T-103211	8/27/2011	-1	Heavy rain and emergency generator problems caused two overflows at station. The first overflow alarm was from 3:09 pm on 8/27 and lasted until 2:59 am on 8/28. The second overflow alarm went from 5:15 to 8:49 am on 8/28. Rain gauge at the station recorded 10.57" of rain for 8/27.
232	Greensprings	3	2007-T-100910	10/6/2006	70	Hose attached to drain valve on Godwin pump set up at station blew apart. Wastewater spilled onto ground for approximately seven minutes.
			2008-T-101345	11/29/2007	1,025	Crew set up bypass hose around station to conduct maintenance. The hose blew apart when 12" pump was started. Replaced hose but another section blew apart when re-tested.
			2012-T-103212	8/27/2011	-1	Heavy rains and failure of one of the pumps during hurricane Irene caused station to overflow. Rain gauge at Ford's Colony PS recorded 10.57" of rain for 8/27.
<b>SOUTH SHORE</b>						
101	Arctic Avenue	3	SR99-26	9/10/1999	6,500	l/l. Very wet period followed by 3.24" of rain in 24 hours.
			SR99-66	10/17/1999	26,800	Hurricane Irene
			2005-T-0247	8/3/2004	675	TS Alex. 2.66" on 8/3. 1.32" in 90 minutes. 5th wettest July.
102	Ashland Circle	4	SR99-43	9/15/1999	2,310	Hurricane Floyd. 8.31" of rain @ Luxembourg Ave PS 9/15-16.
			SR99-70	10/17/1999	-1	Hurricane Irene. Quantity unknown. Flooding.
			2003-T-1312	1/24/2003	30	Operator error. Int. Tech left valve open briefly on emerg pump.
			2004-T-0530	9/18/2003	75,600	Hurricane Isabel. Power outage. Widespread flooding.
104	Cedar Lane	3	SR99-46	9/15/1999	72,000	Hurricane Floyd. 11.40" of rain @ Pughsville PRS 9/15-16.
			2005-T-0518	9/1/2004	60	Sluice gate broke during PM.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2005-T-100286	6/14/2005	50	Bypass pumps had been set up in order to conduct wet well rehab at the station. The joint on the discharge piping was leaking. Pipe fittings broke loose while staff was attempting to stop leak.
105	Chesapeake Blvd	22	SR99-23	9/10/1999	36,000	I/I. Very wet period followed by 2.64" of rain in 16 hours.
			SR99-42	9/15/1999	18,607	Hurricane Floyd. 8.31" of rain @ Luxembourg Ave PS 9/15-16.
			SR99-63	10/17/1999	82,810	Hurricane Irene
			SR99-76	10/19/1999	22,700	Hurricane Irene. Overflow 7:00am - 2:34pm.
			SR99-77	10/19/1999	2,400	Hurricane Irene. Overflow 7:14pm - 11:34pm.
			SR99-79	10/20/1999	35,110	0.99" of rain @ Va Bch Blvd PS on 10/20-21 after 8.52" on 10/17-18.
			2003-T-1470	2/16/2003	-1	2.55" rain 2/15-2/17. Overflow qty unknown due to tidal flooding.
			2003-T-1472	2/17/2003	375	2.55" rain 2/15-2/17. Presidents Day Storm.
			2003-T-2043	4/11/2003	124,750	4.88" of rain at Norfolk Airport April 7-11
			2004-T-1226	12/14/2003	17,830	1.73" of rainfall on 12/14. 1.49 inches in 8.5 hours.
			2005-T-0202	8/2/2004	10,865	TS Alex. 3.21" in 2 hours. Following 5th wettest July.
			2005-T-0213	8/3/2004	167,460	TS Alex. >4" on 8/2. 2.85" on 8/3. 1.93" in 90 minutes 8/3.
			2005-T-0360	8/14/2004	662,700	TS Charley. 5.16" 8/12-8/16. 9.77" 8/1-8/16.
			2005-T-0605	9/15/2004	4,020	Excessive I/I. 1.79" of rain for one hour prior to event.
			2006-T-100661	6/14/2006	-1	Pump station overflowed due to excessive I/I. Area received several inches of rain due to remnants of TS Alberto.
2007-T-100794	9/1/2006	-1	Heavy rainfall from TS Ernesto created excessive I/I & power outages in the area. Station experienced control problem with only two of three pumps operating in automatic position. Norfolk received record rainfall for day.			
2007-T-100989	11/22/2006	3,650	Heavy rains and high wind from coastal storm caused flooding and excessive I/I. Pump station overflowed at tide gate from 12:46 pm to 1:03 pm and then from 1:23 to 2:19 pm at estimated rate of 50 gpm.			

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2007-T-101146	2/27/2007	50	Contractor set up bypass piping around station. One of joints was leaking so it was opened to replace gasket causing wastewater to spill over berm.
			2011-T-102739	9/30/2010	72,708	Pump station overflowed due to high flows caused by remnants of TS Nicole interacting with low pressure system. Rain gauge at Luxembourg Pump Station recorded 11.95" of rainfall during 48-hour period with 10" of rain received on 9/30. Initial estimated flow rate of 10 gpm.
			2011-T-103181	8/27/2011	-1	Equipment failure during hurricane Irene. The 6" emergency pump that was installed to assist the pump station pumps during high flows failed to operate automatically. The controls for the pumps failed under high pressure and flow. Crews observed full pipe of water of overflowing from tide gate. Telog recorded 3 hour period where the wet well level was higher than the tide gate. Rain gauge at Virginia Beach Blvd PS recorded 8.29" of rain for 8/27.
			2013_T-103499	8/28/2012	16,920	Heavy rain within a short duration of time caused flows to increase and pump station to overflow. Rain gauge at Luxembourg Avenue Pump Station recorded 2.20" of rain within four hours.
			2013-T-103549	10/29/2012	567,124	High flows from hurricane Sandy caused pump station to overflow. High tides in the area were approximately 3-4 feet higher than normal tides. Rain gauge at Virginia Beach Blvd PS recorded 3.59" of rain for 10/29.
106	City Park	3	SR99-72	10/17/1999	-1	Hurricane Irene. Quantity unknown. Flooding.
			2004-T-0533	9/18/2003	-1	Hurricane Isabel. Power outage. Tidal flooding.
			2012-T-103324	12/12/2011	45	Corrosion caused a hole to develop in the pipe used for the emergency connection to the portable pump. Pipe is in the ground and spilled intermittently when pump station operated.
108	Dovercourt Road	1	SR99-67	10/17/1999	23,675	Hurricane Irene
109	Dozier's Corner	5	SR99-44	9/15/1999	-1	Qty unknown. Flooding. 6.53" of rain @ Ches PS #34 on 9/15-16.
			SR99-71	10/17/1999	-1	Hurricane Irene. Quantity unknown. Flooding.
			2004-T-0531	9/18/2003	15,000	Hurricane Isabel. Widespread flooding and power outages.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2006-T-100660	6/14/2006	-1	Pump station overflowed due to excessive I/I. Area received several inches of rain due to remnants of TS Alberto.
			2007-T-100798	9/1/2006	-1	Heavy rainfall from TS Ernesto created excessive I/I and flooding in area. Rainfall gauges in city reported total rainfall amounts from 6.8 to 7.2 inches.
110	Ferebee Avenue	1	2013-T-103550	10/29/2012	6,420	High flows from hurricane Sandy caused pump station to overflow at estimated rate of 15 gpm. The overflow stopped at 5:23 pm but restarted at 8:29 pm during high tide and heavy rain. The rain gauge at the station recorded over 8 inches of rain during October 28-29.
			2005-T-0215	8/3/2004	-1	TS Alex. 4.30" 8/1-8/3. Following 5th wettest July.
			2007-T-100799	9/1/2006	-1	Heavy rainfall from TS Ernesto created excessive I/I and power outages in area. Station had electrical control problem which resulted in only 2 of 3 pumps operating in automatic position. Station gauge recorded 8.27" rainfall for day.
			2012-T-103227	8/30/2011	448,000	Horizontal crack on 18" cast iron force main. This is on the discharge side of the station. Private citizen approached HRSD staff during routine station check and informed them of problem.
			SR99-51	9/16/1999	-1	Qty unknown. Flooding. 8.31" of rain @ Luxembourg Ave PS 9/15-16.
			2011-T-102713	9/30/2010	-1	Manhole in front of station overflowed due to high flows caused by remnants of TS Nicole interacting with low pressure system. Rain gauge at Luxembourg Pump Station recorded 11.95" of rainfall during 48-hour period with 10" of rain received on 9/30.
			2012-T-103184	8/27/2011	10,400	Equipment failure during hurricane Irene. The 6" emergency pump that was installed to assist the pump station pumps during high flows failed to operate automatically. Crews reported observing approximately 50 gpm from each of 2 manholes in front of station. Rain gauge at Bancker Road recorded 7.44" of rain for 8/27.
			2013-T-103502	8/28/2012	-1	Area received heavy rain within a short duration of time causing overflows within system. Rain gauge at Luxembourg Avenue Pump Station recorded 2.20" of rain within four hours. Crew revalved system in an attempt to stop overflow at another HRSD station but it caused the two manholes beside Monroe to overflow briefly.
116	Norchester	6	SR99-24	9/10/1999	6,000	I/I. Very wet period followed by 3.35" of rain in 20 hours.



Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
	Street		SR99-42	9/15/1999	6,960	Hurricane Floyd. 9.30" of rain @ Va Beach Blvd PS 9/15-16.
			SR99-61	10/17/1999	5,220	Hurricane Irene
			2005-T-0358	8/14/2004	-1	TS Charley. No overflow when on site. 3.36" 8/14. 9.77" 8/1-8/16.
			2007-T-101179	4/19/2007	40,000	20 inch cast iron force main on discharge side of PS had horizontal crack. Leaking started at estimated rate of 400 gpm for 75 minutes, decreased to 200 ppm for 35 minutes, then increased to 300 gpm for 110 minutes.
			2007-T-101183	4/25/2007	195	Gasket failure on 12" bypass pump discharge piping at the station. Lasted for two minutes.
119	Park Avenue	4	SR99-11	8/14/1999	-1	l/l. 4.56 inches of rain in 2 hours prior to event.
			SR99-19	9/10/1999	30,000	l/l. Very wet period followed by 3.35" of rain in 20 hours.
			SR99-57	10/17/1999	42,670	Hurricane Irene
			2005-T-0214	8/3/2004	10,300	TS Alex. >4" on 8/2. 2.85" on 8/3. 1.93" in 90 minutes 8/3.
123	Quail Avenue	1	2007-T-100801	9/1/2006	-1	Heavy rainfall from TS Ernesto created excessive l/l and flooding in area. Rain gauges in city recorded rainfall totals from 6.8 to 7.2 inches.
124	Richmond Crescent	5	SR99-48	9/15/1999	-1	Qty unknown. Flooding. 8.31" of rain @ Luxembourg Ave PS 9/15-16.
			2004-T-0534	9/18/2003	-1	Hurricane Isabel. Power outage. Tidal flooding in generator fuel tank.
			2004-T-0704	9/25/2003	100	Leaking joint on PS site. Tightened bolts. Vaccon picked up spill.
			2005-T-0359	8/14/2004	-1	TS Charley. 3.36" 8/14. 9.77" 8/1-8/16. Area flooding.
			2007-T-100804	9/1/2006	-1	Norfolk received record amount of rainfall from TS Ernesto which created excessive l/l and flooded the area. Rainfall gauges throughout the city recorded rainfall totals from 7.3 to 8.9 inches for the day.
125	Seay Avenue	5	SR99-68	10/17/1999	18,325	Hurricane Irene
			2003-T-0670	10/8/2002	250	Debris or leak in bubbler control line. Overflow at cleanout.
			2005-T-0201	8/2/2004	14,300	TS Alex. 3.21" in 2 hours. Following 5th wettest July.
			2005-T-0356	8/14/2004	150	TS Charley. Spill occurred during install of 6" portable pump.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2012-T-103182	8/27/2011	1,400	Equipment failure during hurricane Irene. The 6" emergency pump that was installed to pump flows failed to operate automatically. Crew went to station in response to loss of power and communications. Manhole outside station was overflowing. Rain gauge at Virginia Beach Blvd PS recorded 8.29" of rain for 8/27.
127	State Street	5	SR99-64	10/17/1999	15,890	Hurricane Irene
			2004-T-0529	9/19/2003	450	Mechanical failure. Broken air line in bubbler system.
			2005-T-100227	3/14/2005	22	Upstream Gravity Line (SG-096). Bubbler system on State Street Pump Station failed. The wet well gauge registered zero inches so the pumps did not come on when station wet well level rose. The system backed up and a nearby manhole overflowed.
			2006-T-100659	6/14/2006	546	Upstream Gravity Line (SG-202). Manhole near pump station overflowed at estimated rate of 3 gpm due to excessive I/I. Area received several inches of rain due to remnants of TS Alberto. Manhole located at Pearl and Ligon Street.
			2007-T-100802	9/1/2006	-1	Norfolk received record amount of rainfall from TS Ernesto which created excessive I/I and flooded area. Overflow discharged from manhole on Pearl and Ligon Streets. Rainfall totals from 7.3 to 8.9" recorded for day.
128	Steamboat Creek	1	2007-T-100803	9/1/2006	-1	Norfolk received record amount of rainfall from TS Ernesto which created excessive I/I and flooded the area. Rainfall gauges throughout the city recorded rainfall totals from 7.3 to 8.9 inches for the day.
131	Washington Plant	1	2005-T-0357	8/14/2004	-1	TS Charley. 2.76" on 8/14, 2.57" in 7 hours. Area flooding.
135	Suffolk	9	SR99-18	9/10/1999	11,650	I/I. Very wet period followed by 2.47" of rain in 14 hours.
			SR99-31	9/15/1999	51,990	Hurricane Floyd. 13.03" of rain @ Suffolk PS 9/15-16.
			SR99-58	10/17/1999	75,200	Hurricane Irene
			SR00-12	4/13/2000	100	Mechanical failure; failed connection in bubbler system.
			SR01-11	11/5/2001	250	Failure in pump controls. Ckt board, relay, & temp probe replaced.
			2003-T-1966	4/8/2003	34,400	1.98" of rain on 4/9.
			2004-T-0535	9/18/2003	-1	Hurricane Isabel. Widespread flooding.

Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2004-T-1227	12/14/2003	-1	2.27" of rainfall on 12/14. 2.06" in 9 hours.
			2007-T-100987	11/22/2006	-1	Heavy rains and high winds from coastal storm created area flooding and excessive I/I. Pump failed at pump station during storm due to control problems.
137	Bowers Hill PRS	1	2008-T-101243	8/14/2007	6,000	Contractor had installed bypass piping at station in order to do construction work inside of station. Contractor hit 2" ball valve on the bypass piping.
142	Jamestown Crescent	4	SR99-27	9/10/1999	470	I/I. Very wet period followed by 2.64" of rain in 16 hours.
			SR99-38	9/15/1999	64,980	Hurricane Floyd. 8.31" of rain @ Luxembourg Ave PS 9/15-16.
			2004-T-0532	9/19/2003	2,240	Hurricane Isabel. Power outage. Widespread flooding.
			2013-T-103500	8/29/2012	14,650	Heavy rain within a short duration of time caused flows to increase and pump station to overflow. Rain gauge at Luxembourg Avenue Pump Station recorded 2.20" of rain within four hours.
141	Hanover Avenue	3	SR99-21	9/10/1999	14,700	I/I. Very wet period followed by 2.64" of rain in 16 hours.
			SR99-65	10/17/1999	9,150	Hurricane Irene.
			2012-T-103501	8/28/2012	475	Heavy rain within a short duration of time caused flows to increase and pump station to overflow. Rain gauge at Luxembourg Avenue Pump Station recorded 2.20" of rain within four hours.
144	Elmhurst Lane	1	2008-T-101270	9/12/2007	30	Crew was conducting routine wet well cleaning when metal clamp on hose on bypass pump blew off.
146	Camden Avenue	1	2012-T-103121	7/14/2011	-1	A break in 36" gravity line (SPS-146) leading into wet well was discovered but groundwater was surcharging the gravity line at the time. A problem was suspected during shallow groundwater monitoring on 7/14 which suggested wet well influence in the groundwater. Staff followed up with an inspection of the line and wet well. Contractor was brought in July 25-29 to CCTV the line and found two leaks in the last stick of pipe entering the wet well and a few leaks in the wet well.
147	Chesterfield Blvd	4	SR99-13	8/30/1999	-1	Check valve ragged up. Excessive flow due to tidal flooding.
			SR99-36	9/15/1999	-1	Qty unknown. Flooding. 9.30" of rain @ Va Beach Blvd PS 9/15-16.
			SR99-62	10/17/1999	-1	Hurricane Irene. Quantity unknown. Flooding.

**Table B-6. Summary of Pump Station-Related SSOs (updated February 2014)**

Pump Station Number	Pump Station Name	Total SSO Occurrences Between 1999 & Oct 2013	SSORS Report Number/ Tracking Number	Date of SSO	Volume Not Recovered (gallons)	Reason for SSO
			2007-T-100795	9/1/2006	-1	Heavy rainfall from TS Ernesto created excessive I/I and flooding in the area. Weather gauges throughout the city recorded rainfall totals ranging from 7.3 to 8.9 inches.

Table B-7. Pump Station Alarms																
PS	Name	Facility Type	Wet Well High Level Alarm		Wet Well Low Level Alarm		Dry Well Flood Alarm		Loss of Utility Power		Generator ON/OFF		Alternate Power in use		Pump Failure	
			Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational
101	Arctic Avenue	PS	5/2/2012	Yes	7/8/2010	Assessed from wet well inspection.	5/2/2012	Yes	5/2/2012	Yes	-	N/A	5/2/2012	Yes	5/2/2012	Yes
102	Ashland Circle	PS	5/14/2012	Yes	5/12/2011	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
103	Bainbridge Blvd	PS	5/10/2012	Yes	3/9/2011	Assessed from wet well inspection.	5/10/2012	Yes	5/10/2012	Yes	5/10/2012	Yes	-	N/A	5/10/2012	Yes
104	Cedar Lane	PS	5/11/2012	Yes	6/15/2011	Assessed from wet well inspection.	5/11/2012	Yes	5/11/2012	Yes	-	N/A	5/11/2012	Yes	5/11/2012	Yes
105	Chesapeake Blvd	PS	5/14/2012	Yes	5/13/2011	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	5/14/2012	Yes	-	N/A	5/14/2012	Yes
106	City Park	PS	5/11/2012	Yes	5/12/2011	Assessed from wet well inspection.	5/11/2012	Yes	5/11/2012	Yes	-	N/A	-	N/A	5/11/2012	Yes
107	Colley Avenue	PS	5/11/2012	Yes	6/8/2011	Assessed from wet well inspection.	5/11/2012	Yes	5/11/2012	Yes	5/11/2012	Yes	-	N/A	5/11/2012	Yes
108	Dovercourt Road	PS	5/14/2012	Yes	6/24/2011	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	-	N/A	5/14/2012	Yes	5/14/2012	Yes
109	Dozier's Comer	PS	5/25/2012	Yes	9/22/2010	Assessed from wet well inspection.	5/25/2012	Yes	5/25/2012	Yes	-	N/A	-	N/A	5/25/2012	Yes
110	Ferebee Avenue	PS	5/10/2012	Yes	4/25/2011	Assessed from wet well inspection.	5/10/2012	Yes	5/10/2012	Yes	5/10/2012	Yes	-	N/A	5/10/2012	Yes
111	Granby Street	PS	5/14/2012	Yes	5/13/2011	Assessed from wet well inspection.	-	N/A	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
112	Independence Blvd	PRS	-	N/A	-	N/A	5/1/2012	Yes	5/1/2012	Yes	5/1/2012	Yes	-	N/A	5/1/2012	Yes
113	Luxembourg Avenue	PS	5/21/2012	Yes	5/23/2011	Assessed from wet well inspection.	5/21/2012	Yes	5/21/2012	Yes	5/21/2012	Yes	-	N/A	5/21/2012	Yes
114	Monroe Place	PS	5/14/2012	Yes	5/17/2011	Assessed from wet well inspection.	-	N/A	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
115	Newtown Road	PS	5/1/2012	Yes	5/24/2011	Assessed from wet well inspection.	5/1/2012	Yes	5/1/2012	Yes	5/1/2012	Yes	-	N/A	5/1/2012	Yes
116	Norchester Street	PS	5/14/2012	Yes	8/5/2010	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	-	N/A	5/14/2012	Yes	5/14/2012	Yes
117	North Shore Road	PS	5/14/2012	Yes	6/24/2011	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	5/14/2012	Yes	-	N/A	5/14/2012	Yes
118	Norview Avenue	PS	5/14/2012	Yes	5/12/2011	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
119	Park Avenue	PS	5/10/2012	Yes	4/13/2011	Assessed from wet well inspection.	5/10/2012	Yes	5/10/2012	Yes	5/10/2012	Yes	-	N/A	5/10/2012	Yes
120	Pine Tree	PRS	-	N/A	-	N/A	5/1/2012	Yes	5/1/2012	Yes	5/1/2012	Yes	-	N/A	5/1/2012	Yes
121	Plume Street	PS	5/14/2012	Yes	6/29/2011	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
122	Powhatan Avenue	PS	5/21/2012	Yes	5/17/2011	Assessed from wet well inspection.	5/21/2012	Yes	5/21/2012	Yes	-	N/A	-	N/A	5/21/2012	Yes
123	Quail Avenue	PS	5/15/2012	Yes	9/14/2011	Assessed from wet well inspection.	5/15/2012	Yes	5/15/2012	Yes	-	N/A	-	N/A	5/15/2012	Yes

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PS	Name	Facility Type	Wet Well High Level Alarm		Wet Well Low Level Alarm		Dry Well Flood Alarm		Loss of Utility Power		Generator ON/OFF		Alternate Power in use		Pump Failure	
			Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational
124	Richmond Crescent	PS	5/14/2012	Yes	5/17/2011	Assessed from wet well inspection.	5/14/2012	Yes	5/14/2012	Yes	5/14/2012	Yes	-	N/A	5/14/2012	Yes
125	Seay Avenue	PS	5/11/2012	Yes	5/26/2011	Assessed from wet well inspection.	5/11/2012	Yes	5/11/2012	Yes	-	N/A	-	N/A	5/11/2012	Yes
127	State Street	PS	5/15/2012	Yes	8/27/2010	Assessed from wet well inspection.	5/15/2012	Yes	5/15/2012	Yes	5/15/2012	Yes	-	N/A	5/15/2012	Yes
128	Steamboat Creek	PS	5/1/2012	Yes	3/9/2011	Assessed from wet well inspection.	5/1/2012	Yes	5/1/2012	Yes	5/1/2012	Yes	-	N/A	5/1/2012	Yes
129	Taussig Blvd	PS	5/21/2012	Yes	6/9/2011	Assessed from wet well inspection.	5/21/2012	Yes	5/21/2012	Yes	-	N/A	5/21/2012	Yes	5/21/2012	Yes
130	Virginia Beach Blvd	PS	5/11/2012	Yes	5/24/2011	Assessed from wet well inspection.	5/11/2012	Yes	5/11/2012	Yes	-	N/A	-	N/A	5/11/2012	Yes
131	Washington District	PS	5/25/2012	Yes	3/8/2011	Assessed from wet well inspection.	5/25/2012	Yes	5/25/2012	Yes	-	N/A	5/25/2012	Yes	5/25/2012	Yes
132	Willoughby Avenue	PS	5/17/2012	Yes	4/25/2011	Assessed from wet well inspection.	5/17/2012	Yes	5/17/2012	Yes	-	N/A	-	N/A	5/17/2012	Yes
133	Providence Road	PRS	-	N/A	-	N/A	5/3/2012	Yes	5/3/2012	Yes	5/3/2012	Yes	-	N/A	5/3/2012	Yes
134	Pughsville Road	PRS	-	N/A	-	N/A	5/7/2012	Yes	6/4/2012	Yes	6/4/2012	Yes	-	N/A	5/7/2012	Yes
135	Suffolk	PS	5/7/2012	Yes	6/29/2011	Assessed from wet well inspection.	5/7/2012	Yes	6/19/2012	Yes	6/19/2012	Yes	-	N/A	5/7/2012	Yes
137	Bowers Hill	PRS	-	N/A	-	N/A	5/7/2012	Yes	6/4/2012	Yes	6/4/2012	Yes	-	N/A	5/7/2012	Yes
138	Deep Creek	PRS	-	N/A	-	N/A	5/7/2012	Yes	6/4/2012	Yes	6/4/2012	Yes	-	N/A	5/7/2012	Yes
139	Quail Avenue PRS	PRS	-	N/A	-	N/A	5/15/2015	Yes	5/15/2012	Yes	5/15/2012	Yes	-	N/A	5/15/2012	Yes
140	Atlantic Avenue	PRS	-	N/A	-	N/A	5/2/2012	Yes	5/2/2012	Yes	5/2/2012	Yes	-	N/A	5/2/2012	Yes
141	Hanover Avenue	PS	5/14/2012	Yes	5/13/2011	Assessed from wet well inspection.	-	N/A	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
142	Jamestown Crescent	PS	5/14/2012	Yes	5/13/2011	Assessed from wet well inspection.	-	N/A	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
143	Shipps Comer	PRS	-	N/A	-	N/A	5/3/2012	Yes	5/3/2012	Yes	5/3/2012	Yes	-	N/A	5/3/2012	Yes
144	Elmhurst Lane	PS	5/7/2012	Yes	7/12/2011	Assessed from wet well inspection.	5/7/2012	Yes	6/5/2012	Yes	6/5/2012	Yes	-	N/A	5/7/2012	Yes
145	Rodman Avenue	PS	5/7/2012	Yes	10/17/2011	Assessed from routine drawdown.	5/7/2012	Yes	6/4/2012	Yes	6/4/2012	Yes	-	N/A	5/7/2012	Yes
146	Camden Avenue	PS	5/7/2012	Yes	7/22/2011	Assessed from wet well inspection.	5/7/2012	Yes	7/20/2012	Yes	7/20/2012	Yes	-	N/A	5/7/2012	Yes
147	Chesterfield Blvd	PS	5/14/2012	Yes	5/13/2011	Assessed from wet well inspection.	-	N/A	5/14/2012	Yes	-	N/A	-	N/A	5/14/2012	Yes
148	Ingleside Road	PS	5/4/2012	Yes	5/24/2011	Assessed from wet well inspection.	-	N/A	5/4/2012	Yes	-	N/A	-	N/A	5/4/2012	Yes

Table B-7. Pump Station Alarms																
PS	Name	Facility Type	Wet Well High Level Alarm		Wet Well Low Level Alarm		Dry Well Flood Alarm		Loss of Utility Power		Generator ON/OFF		Alternate Power in use		Pump Failure	
			Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Transmission
151	Kempsville Road	PRS	-	N/A	-	N/A	5/3/2012	Yes	5/3/2012	Yes	5/3/2012	Yes	-	N/A	5/3/2012	Yes
152	Terminal Blvd	PRS	-	N/A	-	N/A	5/14/2012	Yes	5/14/2012	Yes	5/14/2012	Yes	-	N/A	5/14/2012	Yes
153	Laskin Road	PRS	-	N/A	-	N/A	5/2/2012	Yes	5/2/2012	Yes	5/2/2012	Yes	-	N/A	5/2/2012	Yes
154	RT 337	PRS	-	N/A	-	N/A	5/7/2012	Yes	6/5/2012	Yes	6/5/2012	Yes	-	N/A	5/7/2012	Yes
201	25th Street	PS	6/28/2012	Yes	10/7/2008	Assessed from routine drawdown.	6/28/2012	Yes	6/28/2012	Yes	6/28/2012	Yes	-	N/A	6/28/2012	Yes
202	33rd Street	PS	6/28/2012	Yes	7/6/2011	Assessed from routine drawdown.	6/28/2012	Yes	6/28/2012	Yes	6/28/2012	Yes	-	N/A	6/28/2012	Yes
203	BayShore	PS	6/19/2012	Yes	7/25/2011	Assessed from wet well inspection.	6/19/2012	Yes	6/19/2012	Yes	6/19/2012	Yes	-	N/A	6/19/2012	Yes
204	Bloxoms Comer	PS	6/19/2012	Yes	8/4/2011	Assessed during corrective maintenance.	6/19/2012	Yes	6/19/2012	Yes	-	N/A	6/19/2012	Yes	6/19/2012	Yes
205	Big Bethel	PRS	-	N/A	-	N/A	6/20/2012	Yes	6/20/2012	Yes	6/20/2012	Yes	-	N/A	6/20/2012	Yes
206	Bridge Street	PS	6/19/2012	Yes	8/29/2011	Assessed from routine drawdown.	6/19/2012	Yes	6/19/2012	Yes	6/19/2012	Yes	-	N/A	6/19/2012	Yes
207	Center Avenue	PS	6/28/2012	Yes	3/6/2009	Assessed during corrective maintenance.	6/28/2012	Yes	7/3/2012	Yes	7/3/2012	Yes	-	N/A	6/28/2012	Yes
208	Claremont	PS	6/28/2012	Yes	7/15/2011	Assessed from wet well inspection.	6/28/2012	Yes	6/28/2012	Yes	6/28/2012	Yes	-	N/A	6/28/2012	Yes
209	Copeland Park	PS	6/28/2012	Yes	1/4/2012	Assessed during corrective maintenance.	6/28/2012	Yes	6/28/2012	Yes	6/28/2012	Yes	-	N/A	6/28/2012	Yes
210	Ferguson Park	PS	6/28/2012	Yes	12/22/2011	Assessed during corrective maintenance.	6/28/2012	Yes	7/3/2012	Yes	7/3/2012	Yes	-	N/A	6/28/2012	Yes
211	Hampton Univ.	PS	6/20/2012	Yes	9/27/2011	Assessed from routine drawdown.	6/20/2012	Yes	6/20/2012	Yes	-	N/A	6/20/2012	Yes	6/20/2012	Yes
212	Hilton School	PS	7/3/2012	Yes	10/12/2011	Assessed from routine drawdown.	7/3/2012	Yes	7/3/2012	Yes	7/3/2012	Yes	-	N/A	7/3/2012	Yes
213	Jefferson Avenue	PS	6/28/2012	Yes	7/6/2011	Assessed from routine drawdown.	6/28/2012	Yes	6/28/2012	Yes	-	N/A	-	N/A	6/28/2012	Yes
214	Kingsmill	PS	6/26/2012	Yes	10/25/2011	Assessed during corrective maintenance.	6/26/2012	Yes	6/26/2012	Yes	6/26/2012	Yes	-	N/A	6/26/2012	Yes
215	Lee Hall*	PRS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
216	Lucas Creek	PS	6/26/2012	Yes	6/3/2009	Assessed during corrective maintenance.	6/26/2012	Yes	6/26/2012	Yes	6/26/2012	Yes	-	N/A	6/26/2012	Yes
217	Langley Circle	PS	6/19/2012	Yes	9/22/2010	Assessed from wet well inspection.	6/19/2012	Yes	6/19/2012	Yes	-	N/A	6/19/2012	Yes	6/19/2012	Yes
218	Morrison	PS	7/3/2012	Yes	9/26/2008	Assessed during corrective maintenance.	7/3/2012	Yes	7/3/2012	Yes	7/3/2012	Yes	-	N/A	7/3/2012	Yes

Table B-7. Pump Station Alarms																
PS	Name	Facility Type	Wet Well High Level Alarm		Wet Well Low Level Alarm		Dry Well Flood Alarm		Loss of Utility Power		Generator ON/OFF		Alternate Power in use		Pump Failure	
			Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational	Test Date	Alarm Operational
219	Newmarket	PS	6/28/2012	Yes	6/8/2012	Assessed during corrective maintenance.	6/28/2012	Yes	6/28/2012	Yes	6/28/2012	Yes	-	N/A	6/28/2012	Yes
220	Normandy Lane	PS	7/3/2012	Yes	10/6/2011	Assessed from routine drawdown.	7/3/2012	Yes	7/3/2012	Yes	7/3/2012	Yes	-	N/A	7/3/2012	Yes
221	Patrick Henry	PS	6/20/2012	Yes	10/7/2009	Assessed during corrective maintenance.	6/20/2012	Yes	6/20/2012	Yes	6/20/2012	Yes	-	N/A	6/20/2012	Yes
223	Washington Street	PS	6/19/2012	Yes	6/30/2011	Assessed from routine drawdown.	6/19/2012	Yes	6/19/2012	Yes	6/19/2012	Yes	-	N/A	6/19/2012	Yes
224	Woodland Road	PS	6/19/2012	Yes	9/14/2009	Assessed from wet well inspection.	6/19/2012	Yes	6/19/2012	Yes	6/19/2012	Yes	-	N/A	6/19/2012	Yes
225	Willard Avenue	PS	6/20/2012	Yes	7/14/2010	Assessed from wet well inspection.	6/20/2012	Yes	6/20/2012	Yes	6/20/2012	Yes	-	N/A	6/20/2012	Yes
226	Williamsburg	PS	6/26/2012	Yes	8/5/2011	Assessed from routine drawdown.	6/26/2012	Yes	6/26/2012	Yes	6/26/2012	Yes	-	N/A	6/26/2012	Yes
227	Fort Eustis	PS	6/26/2012	Yes	11/2/2010	Assessed from wet well inspection.	6/26/2012	Yes	6/26/2012	Yes	6/26/2012	Yes	-	N/A	6/26/2012	Yes
229	Colonial Williamsburg	PS	6/27/2012	Yes	8/31/2011	Assessed from wet well inspection.	6/27/2012	Yes	6/27/2012	Yes	6/27/2012	Yes	-	N/A	6/27/2012	Yes
230	Rolling Hills	PS	6/27/2012	Yes	9/1/2011	Assessed from routine drawdown.	6/27/2012	Yes	6/27/2012	Yes	6/27/2012	Yes	-	N/A	6/27/2012	Yes
231	Ford's Colony	PS	6/27/2012	Yes	10/18/2011	Assessed from routine drawdown.	6/27/2012	Yes	6/27/2012	Yes	6/27/2012	Yes	-	N/A	6/27/2012	Yes
232	Greensprings	PS	6/26/2012	Yes	9/1/2011	Assessed from routine drawdown.	6/26/2012	Yes	6/26/2012	Yes	6/26/2012	Yes	-	N/A	6/26/2012	Yes
233	Lodge Road	PS	6/26/2012	Yes	8/30/2011	Assessed from wet well inspection.	6/26/2012	Yes	6/26/2012	Yes	6/26/2012	Yes	-	N/A	6/26/2012	Yes

\*Station is not currently in service.



Table B-8A. SCAT Checklist (updated February 2014)															
Pump Station Number	Facility Information		9VAC25-790-380. SEWAGE PUMPING.							9VAC25-790-390. RELIABILITY.					
Pump Station Number	Type	Installation Year	Is station physically located above the 100-year flood/wave action?	Is station physically located above the 25-year flood/wave action?	Are at least 2 pumps installed?	Does the PS Firm Capacity exceed the observed peak hourly flow from the FPR period?	Can pumps pass 3" or grinder discharge or pass 2" with integral screen?	Are check valves in place on each line?	Is the wet well designed for unsettled sewage? If applicable, are fillets sloped one-to-one and is the horizontal area no greater than necessary?	Does the station have allowances for continuous operability 24 hours per day?	Method to Provide Continuous Operability	Is the generator sized in accordance with the reliability classification of the pump station?	Are the alternate feeds fed from separate substations?	Is the secondary feed rating greater than or equal to the primary?	For dual-feed, are the circuits separated to prevent a common mode of failure?
101	PS	1967	Y	Y	Y	Y	Y	Y	N	Y	Dual Feed	N/A	Y	INA	INA
102	PS	1955	N	N	Y	Y	Y	Y	N	Y	Permanent Reserve Pump	N/A	N/A	N/A	N/A
103	PS	1948	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
104	PS	1962	Y	Y	Y	Y	Y	Y	N	Y	Dual Feed	N/A	Y	INA	INA
105	PS	1954	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
106	PS	1948	Y	Y	Y	Y	Y	Y	N	Y	Permanent Reserve Pump	N/A	N/A	N/A	N/A
107	PS	1969	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A
108	PS	1961	Y	Y	Y	Y	Y	Y	Y	Y	Dual Feed	N/A	Y	INA	Y
109	PS	1962	Y*	Y*	Y	N	Y	Y	N	Y	Permanent Reserve Pump	N/A	N/A	N/A	N/A
110	PS	1951	N	N	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
111	PS	1977	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A
112	PRS	1968	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	INA	N/A	N/A	N/A
113	PS	1962	N	N	Y	Y	Y	Y	N	Y	Permanent Generator	INA	N/A	N/A	N/A
114	PS	1953	N	N	Y	N	Y	Y	INA	Y	Permanent Reserve Pump	N/A	N/A	N/A	N/A
115	PS	1967	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A
116	PS	1948	Y	Y	Y	N	Y	Y	N	Y	Dual Feed	N/A	Y	INA	INA
117	PS	1949	N	N	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
118	PS	1955	Y	Y	Y	N	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
119	PS	1922	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	INA	N/A	N/A	N/A
120	PRS	1970	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
121	PS	1956	Y	Y	Y	Y	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
122	PS	1948	Y	Y	Y	N	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
123	PS	1958	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	INA	N/A	N/A	N/A
124	PS	1948	N	Y	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
125	PS	1952	Y	Y	Y	Y	Y	Y	N	Y	Permanent Reserve Pump	N/A	N/A	N/A	N/A
127	PS	1982	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	INA	N/A	N/A	N/A
128	PS	1948	N	Y	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
129	PS	1943	Y	Y	Y	Y	Y	Y	Y	Y	Dual Feed	N/A	Y	INA	Y
130	PS	1976	Y	Y	Y	Y	Y	Y	INA	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
131	PS	1979	N	N	Y	Y	Y	Y	INA	Y	Dual Feed	N/A	Y	INA	Y
132	PS	1948	Y	Y	Y	N	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
133	PRS	1979	Y	Y	Y	INA	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
134	PRS	1979	Y	Y	Y	N	Y	Y	N/A	Y	Permanent Generator	INA	N/A	N/A	N/A
135	PS	1979	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A
137	PRS	1977	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
138	PRS	1977	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
139	PRS	1978	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	INA	N/A	N/A	N/A

Table B-8A. SCAT Checklist (updated February 2014)															
Pump Station Number	Facility Information		9VAC25-790-380. SEWAGE PUMPING.							9VAC25-790-390. RELIABILITY.					
Pump Station Number	Type	Installation Year	Is station physically located above the 100-year flood/wave action?	Is station physically located above the 25-year flood/wave action?	Are at least 2 pumps installed?	Does the PS Firm Capacity exceed the observed peak hourly flow from the FPR period?	Can pumps pass 3" or grinder discharge or pass 2" with integral screen?	Are check valves in place on each line?	Is the wet well designed for unsettled sewage? If applicable, are fillets sloped one-to-one and is the horizontal area no greater than necessary?	Does the station have allowances for continuous operability 24 hours per day?	Method to Provide Continuous Operability	Is the generator sized in accordance with the reliability classification of the pump station?	Are the alternate feeds fed from separate substations?	Is the secondary feed rating greater than or equal to the primary?	For dual-feed, are the circuits separated to prevent a common mode of failure?
140	PRS	1976	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
141	PS	1953	N	N	Y	N	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
142	PS	1953	N	N	Y	N	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
143	PRS	1984	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
144	PS	1962	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
145	PS	1942	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A
146	PS	1946	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
147	PS	1976	N	N	Y	INA	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
148	PS	1976	Y	Y	Y	Y	Y	Y	N	Y	Crew response with portable equipment	N/A	N/A	N/A	N/A
151	PRS	1995	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
152	PRS	1992	Y	Y	Y	N	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
153	PRS	1993	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
154	PRS	2005	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
201	PS	1944	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
202	PS	1944	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
203	PS	1946	Y*	Y*	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
204	PS	1966	N	N	Y	N	Y	Y	N	Y	Dual Feed	N/A	Y	INA	Y
205	PRS	1971	Y	Y	Y	Y	Y	Y	N/A	Y	Permanent Generator	Y	N/A	N/A	N/A
206	PS	1945	Y*	Y*	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
207	PS	1946	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
208	PS	1944	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
209	PS	1977	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	INA	N/A	N/A	N/A
210	PS	1968	Y	Y	Y	Y	N	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
211	PS	1945	Y*	Y*	Y	INA	Y	Y	N	Y	Dual Feed	N/A	INA	INA	INA
212	PS	1948	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
213	PS	1944	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	N/A	N/A	N/A	N/A
214	PS	1971	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A
215	PRS	1974	Y	Y	Y	INA	Y	Y	N/A	Y	Permanent Generator	INA	N/A	N/A	N/A
216	PS	1970	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	INA	N/A	N/A	N/A
217	PS	1969	Y	Y	Y	Y	Y	Y	Y	Y	Dual Feed	N/A	Y	INA	INA
218	PS	1955	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
219	PS	1953	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	INA	N/A	N/A	N/A
220	PS	1968	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
221	PS	1943	Y	Y	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
223	PS	1947	N	Y	Y	N	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
224	PS	1960	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
225	PS	1946	Y*	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A

Table B-8A. SCAT Checklist (updated February 2014)															
Pump Station Number	Facility Information		9VAC25-790-380. SEWAGE PUMPING.							9VAC25-790-390. RELIABILITY.					
Pump Station Number	Type	Installation Year	Is station physically located above the 100-year flood/wave action?	Is station physically located above the 25-year flood/wave action?	Are at least 2 pumps installed?	Does the PS Firm Capacity exceed the observed peak hourly flow from the FPR period?	Can pumps pass 3" or grinder discharge or pass 2" with integral screen?	Are check valves in place on each line?	Is the wet well designed for unsettled sewage? If applicable, are fillets sloped one-to-one and is the horizontal area no greater than necessary?	Does the station have allowances for continuous operability 24 hours per day?	Method to Provide Continuous Operability	Is the generator sized in accordance with the reliability classification of the pump station?	Are the alternate feeds fed from separate substations?	Is the secondary feed rating greater than or equal to the primary?	For dual-feed, are the circuits separated to prevent a common mode of failure?
226	PS	1970	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A
227	PS	1998	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
229	PS	2005	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
230	PS	1982	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
231	PS	1988	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
232	PS	2002	Y	Y	Y	Y	Y	Y	N	Y	Permanent Generator	Y	N/A	N/A	N/A
233	PS	2002	Y	Y	Y	Y	Y	Y	Y	Y	Permanent Generator	Y	N/A	N/A	N/A

INA: Information not available

\* Station is equipped with storm boards for extra flooding protection as described in Section 2.5.1.

Table B-8B. SCAT Checklist (updated February 2014)

Table B-8B. SCAT Checklist (updated February 2014)											
Pump Station Number	Facility Information		9VAC25-790-400. PUMPING EQUIPMENT.						9VAC25-790-410. PORTABLE EQUIPMENT AND DIVERSIONS.		
Pump Station Number	Type	Installation Year	Are the motors and controls protected from moisture?	Is the motor protected on all three phases?	Is adequate working clearance available?	Are arc flash labels present?	Is equipment located in wet wells explosion proof?	Is the generator starting system independent of the station power source? Does the system allow for three starts without recharging?	Is the CRT less than or equal to the allowable time?	Can portable pumps operate between the wet well and discharge side?	Are there provisions for rapid and easy connection of lines?
101	PS	1967	Y	INA	N	N	Y	N/A	N/A	Y	Y
102	PS	1955	Y	Y	N	N	Y	N/A	N/A	Y	Y
103	PS	1948	Y	Y	Y	N	Y	Y	N/A	Y	Y
104	PS	1962	Y	Y	INA	Y	Y	N/A	N/A	Y	Y
105	PS	1954	Y	Y	N	Y	Y	Y	N/A	Y	Y
106	PS	1948	Y	Y	N	N	INA	N/A	N/A	Y	Y
107	PS	1969	Y	Y	N	N	Y	Y	N/A	Y	Y
108	PS	1961	Y	Y	Y	N	Y	N/A	N/A	Y	Y
109	PS	1962	Y	Y	Y	N	Y	N/A	N/A	Y	Y
110	PS	1951	Y	Y	Y	N	INA	Y	N/A	Y	Y
111	PS	1977	Y	Y	Y	N	Y	N/A	N/A	Y	Y
112	PRS	1968	Y	INA	N	N	N/A	Y	N/A	N/A	N/A
113	PS	1962	Y	Y	N	N	Y	Y	N/A	Y	Y
114	PS	1953	Y	Y	Y	N	INA	N/A	N/A	Y	Y
115	PS	1967	Y	INA	N	N	Y	Y	N/A	Y	Y
116	PS	1948	Y	Y	Y	Y	Y	N/A	N/A	Y	Y
117	PS	1949	Y	Y	Y	N	Y	Y	N/A	Y	Y
118	PS	1955	Y	Y	Y	Y	Y	N/A	N	Y	Y
119	PS	1922	Y	INA	N	Y	INA	Y	N/A	Y	Y
120	PRS	1970	Y	Y	N	N	N/A	Y	N/A	N/A	N/A
121	PS	1956	Y	Y	Y	Y	Y	N/A	Y	N/A	Y
122	PS	1948	Y	Y	N	N	Y	N/A	N	Y	Y
123	PS	1958	Y	INA	Y	Y	Y	Y	N/A	Y	Y
124	PS	1948	Y	Y	Y	Y	Y	Y	N/A	Y	Y
125	PS	1952	Y	Y	Y	N	Y	N/A	N/A	Y	Y
127	PS	1982	Y	Y	N	N	Y	Y	N/A	Y	Y
128	PS	1948	Y	Y	N	N	INA	Y	N/A	Y	Y
129	PS	1943	Y	INA	Y	N	Y	N/A	N/A	Y	Y
130	PS	1976	Y	Y	N	N	INA	N/A	N	Y	Y
131	PS	1979	Y	Y	Y	N	Y	N/A	N/A	Y	Y
132	PS	1948	Y	Y	N	N	INA	N/A	N	Y	Y
133	PRS	1979	Y	Y	Y	N	N/A	Y	N/A	N/A	N/A
134	PRS	1979	Y	Y	N	N	N/A	Y	N/A	N/A	N/A
135	PS	1979	Y	Y	Y	N	Y	Y	N/A	Y	Y
137	PRS	1977	Y	Y	Y	Y	N/A	Y	N/A	N/A	N/A
138	PRS	1977	Y	Y	Y	Y	N/A	Y	N/A	N/A	N/A
139	PRS	1978	Y	Y	Y	Y	N/A	Y	N/A	N/A	N/A
140	PRS	1976	Y	Y	Y	Y	N/A	Y	N/A	N/A	N/A
141	PS	1953	Y	Y	Y	N	Y	N/A	N	Y	Y
142	PS	1953	Y	Y	Y	N	Y	N/A	N	Y	Y
143	PRS	1984	Y	Y	Y	N	N/A	Y	N/A	N/A	N/A

Table B-8B. SCAT Checklist (updated February 2014)

Table B-8B. SCAT Checklist (updated February 2014)											
Pump Station Number	Facility Information		9VAC25-790-400. PUMPING EQUIPMENT.						9VAC25-790-410. PORTABLE EQUIPMENT AND DIVERSIONS.		
Pump Station Number	Type	Installation Year	Are the motors and controls protected from moisture?	Is the motor protected on all three phases?	Is adequate working clearance available?	Are arc flash labels present?	Is equipment located in wet wells explosion proof?	Is the generator starting system independent of the station power source? Does the system allow for three starts without recharging?	Is the CRT less than or equal to the allowable time?	Can portable pumps operate between the wet well and discharge side?	Are there provisions for rapid and easy connection of lines?
144	PS	1962	Y	Y	Y	Y	Y	Y	N/A	Y	Y
145	PS	1942	Y	Y	N	Y	Y	Y	N/A	Y	Y
146	PS	1946	Y	Y	N	N	INA	Y	N/A	Y	Y
147	PS	1976	Y	Y	Y	N	INA	N/A	N	Y	Y
148	PS	1976	Y	Y	Y	N	INA	N/A	N	Y	Y
151	PRS	1995	Y	Y	Y	Y	N/A	Y	N/A	N/A	N/A
152	PRS	1992	Y	Y	Y	N	N/A	Y	N/A	N/A	N/A
153	PRS	1993	Y	Y	Y	Y	N/A	Y	N/A	N/A	N/A
154	PRS	2005	Y	Y	Y	Y	N/A	Y	N/A	N/A	N/A
201	PS	1944	Y	Y	N	Y	Y	Y	N/A	Y	Y
202	PS	1944	Y	Y	N	N	Y	Y	N/A	Y	Y
203	PS	1946	Y	Y	Y	Y	Y	Y	N/A	Y	Y
204	PS	1966	Y	Y	N	Y	INA	N/A	N/A	Y	Y
205	PRS	1971	Y	Y	N	N	N/A	Y	N/A	N/A	N/A
206	PS	1945	Y	Y	Y	N	Y	Y	N/A	Y	Y
207	PS	1946	Y	Y	N	Y	Y	Y	N/A	Y	Y
208	PS	1944	Y	Y	Y	Y	Y	Y	N/A	Y	Y
209	PS	1977	Y	Y	N	N	Y	Y	N/A	Y	Y
210	PS	1968	Y	Y	N	Y	Y	Y	N/A	Y	Y
211	PS	1945	Y	Y	Y	Y	Y	N/A	N/A	Y	Y
212	PS	1948	Y	Y	Y	Y	Y	Y	N/A	Y	Y
213	PS	1944	Y	Y	Y	Y	Y	N/A	N/A	Y	Y
214	PS	1971	Y	Y	N	N	Y	Y	N/A	Y	Y
215	PRS	1974	Y	Y	Y	N	N/A	Y	N/A	N/A	N/A
216	PS	1970	Y	Y	Y	N	Y	Y	N/A	Y	Y
217	PS	1969	Y	Y	Y	N	Y	N/A	N/A	Y	Y
218	PS	1955	Y	Y	N	Y	Y	Y	N/A	Y	Y
219	PS	1953	Y	Y	Y	N	Y	Y	N/A	Y	Y
220	PS	1968	Y	Y	Y	N	Y	Y	N/A	Y	Y
221	PS	1943	Y	Y	Y	Y	INA	Y	N/A	Y	Y
223	PS	1947	Y	Y	Y	Y	Y	Y	N/A	Y	Y
224	PS	1960	Y	Y	N	Y	Y	Y	N/A	Y	Y
225	PS	1946	Y	Y	N	Y	Y	Y	N/A	Y	Y
226	PS	1970	Y	Y	Y	N	Y	Y	N/A	Y	Y
227	PS	1998	Y	Y	Y	Y	Y	Y	N/A	Y	Y
229	PS	2005	Y	Y	Y	N	Y	Y	N/A	Y	Y
230	PS	1982	Y	Y	N	N	Y	Y	N/A	Y	Y
231	PS	1988	Y	Y	Y	N	Y	Y	N/A	Y	Y
232	PS	2002	Y	Y	Y	N	Y	Y	N/A	Y	Y
233	PS	2002	Y	Y	Y	N	Y	Y	N/A	Y	Y

INA: Information not available

Table B-8C. SCAT Checklist (updated February 2014)

Pump Station Number		Facility Information		9VAC25-790-420. ALARM SYSTEMS.			9VAC25-790-430. ALTERNATIVES			9VAC25-790-440. FORCE MAINS
Pump Station Number	Type	Installation Year	Are the following alarms present? Power, Auxiliary Power, Failure of pumps to discharge liquid, Wet well high liquid level alarm, Dry well high liquid level alarm	Is the alarm in a central location, monitored 24 hours/day?	Does the system have a battery or other backup?	Are the pumps removable and reconnectable without entry?	Are the electrical controls in located in a suitable housing to protect against weather and vandalism?	Are the shut-off and check valves located in separate vault?	Are the pipes anchored?	
101	PS	1967	Y*	Y	Y	N/A	N/A	N/A	Y	
102	PS	1955	Y*	Y	Y	N/A	N/A	N/A	Y	
103	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y	
104	PS	1962	Y*	Y	Y	N/A	N/A	N/A	Y	
105	PS	1954	Y*	Y	Y	N/A	N/A	N/A	Y	
106	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y	
107	PS	1969	Y*	Y	Y	N/A	N/A	N/A	Y	
108	PS	1961	Y*	Y	Y	N/A	N/A	N/A	Y	
109	PS	1962	Y*	Y	Y	N/A	N/A	N/A	Y	
110	PS	1951	Y*	Y	Y	N/A	N/A	N/A	Y	
111	PS	1977	Y*	Y	Y	Y	Y	Y	Y	
112	PRS	1968	Y*	Y	Y	N/A	N/A	N/A	Y	
113	PS	1962	Y*	Y	Y	N/A	N/A	N/A	Y	
114	PS	1953	Y*	Y	Y	N/A	N/A	N/A	Y	
115	PS	1967	Y*	Y	Y	N/A	N/A	N/A	Y	
116	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y	
117	PS	1949	Y*	Y	Y	N/A	N/A	N/A	Y	
118	PS	1955	Y*	Y	Y	N/A	N/A	N/A	Y	
119	PS	1922	Y*	Y	Y	N/A	N/A	N/A	Y	
120	PRS	1970	Y*	Y	Y	N/A	N/A	N/A	Y	
121	PS	1956	Y*	Y	Y	N/A	N/A	N/A	Y	
122	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y	
123	PS	1958	Y*	Y	Y	N/A	N/A	N/A	Y	
124	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y	
125	PS	1952	Y*	Y	Y	N/A	N/A	N/A	Y	
127	PS	1982	Y*	Y	Y	N/A	N/A	N/A	Y	
128	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y	
129	PS	1943	Y*	Y	Y	N/A	N/A	N/A	Y	
130	PS	1976	Y*	Y	Y	N/A	N/A	N/A	Y	
131	PS	1979	Y*	Y	Y	N/A	N/A	N/A	Y	
132	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y	
133	PRS	1979	Y*	Y	Y	N/A	N/A	N/A	Y	
134	PRS	1979	Y*	Y	Y	N/A	N/A	N/A	Y	
135	PS	1979	Y*	Y	Y	N/A	N/A	N/A	Y	
137	PRS	1977	Y*	Y	Y	N/A	N/A	N/A	Y	
138	PRS	1977	Y*	Y	Y	N/A	N/A	N/A	Y	
139	PRS	1978	Y*	Y	Y	N/A	N/A	N/A	Y	
140	PRS	1976	Y*	Y	Y	N/A	N/A	N/A	Y	
141	PS	1953	Y*	Y	Y	Y	Y	Y	Y	
142	PS	1953	Y*	Y	Y	Y	Y	Y	Y	
143	PRS	1984	Y*	Y	Y	N/A	N/A	N/A	Y	
144	PS	1962	Y*	Y	Y	N/A	N/A	N/A	Y	

Table B-8C. SCAT Checklist (updated February 2014)									
Pump Station Number	Facility Information		9VAC25-790-420. ALARM SYSTEMS.			9VAC25-790-430. ALTERNATIVES			9VAC25-790-440. FORCE MAINS
Pump Station Number	Type	Installation Year	Are the following alarms present? Power, Auxiliary Power, Failure of pumps to discharge liquid, Wet well high liquid level alarm, Dry well high liquid level alarm	Is the alarm in a central location, monitored 24 hours/day?	Does the system have a battery or other backup?	Are the pumps removable and reconnectable without entry?	Are the electrical controls in located in a suitable housing to protect against weather and vandalism?	Are the shut-off and check valves located in separate vault?	Are the pipes anchored?
145	PS	1942	Y*	Y	Y	N/A	N/A	N/A	Y
146	PS	1946	Y*	Y	Y	N/A	N/A	N/A	Y
147	PS	1976	Y*	Y	Y	Y	Y	Y	Y
148	PS	1976	Y*	Y	Y	Y	Y	Y	Y
151	PRS	1995	Y*	Y	Y	N/A	N/A	N/A	Y
152	PRS	1992	Y*	Y	Y	N/A	N/A	N/A	Y
153	PRS	1993	Y*	Y	Y	N/A	N/A	N/A	Y
154	PRS	2005	Y*	Y	Y	N/A	N/A	N/A	Y
201	PS	1944	Y*	Y	Y	N/A	N/A	N/A	Y
202	PS	1944	Y*	Y	Y	N/A	N/A	N/A	Y
203	PS	1946	Y*	Y	Y	N/A	N/A	N/A	Y
204	PS	1966	Y*	Y	Y	N/A	N/A	N/A	Y
205	PRS	1971	Y*	Y	Y	N/A	N/A	N/A	Y
206	PS	1945	Y*	Y	Y	N/A	N/A	N/A	Y
207	PS	1946	Y*	Y	Y	N/A	N/A	N/A	Y
208	PS	1944	Y*	Y	Y	N/A	N/A	N/A	Y
209	PS	1977	Y*	Y	Y	N/A	N/A	N/A	Y
210	PS	1968	Y*	Y	Y	N/A	N/A	N/A	Y
211	PS	1945	Y*	Y	Y	N/A	N/A	N/A	Y
212	PS	1948	Y*	Y	Y	N/A	N/A	N/A	Y
213	PS	1944	Y*	Y	Y	N/A	N/A	N/A	Y
214	PS	1971	Y*	Y	Y	N/A	N/A	N/A	Y
215	PRS	1974	Y*	Y	Y	N/A	N/A	N/A	Y
216	PS	1970	Y*	Y	Y	N/A	N/A	N/A	Y
217	PS	1969	Y*	Y	Y	N/A	N/A	N/A	Y
218	PS	1955	Y*	Y	Y	N/A	N/A	N/A	Y
219	PS	1953	Y*	Y	Y	N/A	N/A	N/A	Y
220	PS	1968	Y*	Y	Y	N/A	N/A	N/A	Y
221	PS	1943	Y*	Y	Y	N/A	N/A	N/A	Y
223	PS	1947	Y*	Y	Y	N/A	N/A	N/A	Y
224	PS	1960	Y*	Y	Y	N/A	N/A	N/A	Y
225	PS	1946	Y*	Y	Y	N/A	N/A	N/A	Y
226	PS	1970	Y*	Y	Y	N/A	N/A	N/A	Y
227	PS	1998	Y*	Y	Y	N/A	N/A	N/A	Y
229	PS	2005	Y*	Y	Y	N/A	N/A	N/A	Y
230	PS	1982	Y*	Y	Y	N/A	N/A	N/A	Y
231	PS	1988	Y*	Y	Y	N/A	N/A	N/A	Y
232	PS	2002	Y*	Y	Y	N/A	N/A	N/A	Y
233	PS	2002	Y*	Y	Y	N/A	N/A	N/A	Y

INA: Information not available

\*Station has all alarms except failure of pumps to discharge liquid.

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**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
101	Arctic Ave PS	MMPS-112	Virginia Beach	3	Yes	4883	4,883	7,000	4,448	7,362	756	3,363
102	Ashland Circle PS	GFM-35	Norfolk	HRSD-102	-	-	NA	450	100	199	66	438
103	Bainbridge Blvd	MMPS-115	Norfolk	HRSD-103	-	-	NA	1200	458	916	132	1,054
104	Cedar Lane PS	MMPS-122	Chesapeake	27	Yes	237	7,281	7,400	1,430	3,625	1,491	6,171
				30	No	221						
				31	No	255						
				46	No	95						
				77	No	22						
				264	No	-						
			940	Yes	181							
			Portsmouth	32	No	99						
				34	No	115						
				35	Yes	143						
				36	Yes	107						
				37	Yes	204						
				38	Yes	215						
				39	Yes	716						
				40	Yes	1395						
				42	No	219						
43	No	187										
44	No	120										
46	No	852										

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				47	Yes	147						
				48	Yes	77						
				49	No	192						
				50	No	23						
				51	No	288						
				54	No	49						
				56	No	328						
				60	No	486						
				63	No	124						
				68	Yes	184						
105	Chesapeake Blvd PS	MMPS-043	Norfolk	HRSD-105	-	1292	2875	4,000	3,035	9,254	931	3,160
				HRSD-118	-	-						
				PS-046	-	833						
				PS-048	-	208						
				PS-056	-	-						
				PS-064	-	-						
				PS-070	-	306						
				PS-071	-	236						
106	City Park PS	MMPS-125	Norfolk	HRSD - 106	-	160	160	960	68	71	149	710
				HRSD-111	-	-						
107	Colley Ave PS	MMPS-127	Norfolk	HRSD-107	-	-	NA	8100			1,210	4,602

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
108	Dovercourt Rd PS	MMPS-129	Norfolk	HRSD-108	-	-	NA	11,300	14,670	21,085	1,245	4,997
				PS-023	-	-						
				PS-047	-	-						
				PS-049	-	-						
				PS-069	-	-						
				PS-082	-	-						
				PS-089	-	-						
109	Dozier's Comer PS	GFM-38	Chesapeake	11	Yes	215	531	625	0	0	155	838
				22	Yes	70						
				909	Yes	246						
110	Ferebee Ave PS	GFM-22	Chesapeake	4	Yes	145	1,231	600	0	0	371	1,546
				5	Yes	158						
				6	No	46						
				7	Yes	396						
				8	Yes	57						
				81	Yes	32						
				115	No	61						
				139	No	6						
				140	Yes	3						
				910	Yes	327						
111	Granby Street	MMPS-135	Norfolk	HRSD-111	-	-	NA	600	592	1,185	50	265
113	Luxembourg PS	MMPS-149	Norfolk	HRSD-102	-	-	2976	6800	0	910	113	1,290

**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				HRSD-113	-	118						
				PS-018	-	1218						
				PS-021	-	556						
				PS-030	-	410						
				PS-033	-	667						
				PS-130	-	7						
114	Monroe Place PS	MMPS-150	Norfolk	HRSD-114	-	-	NA	1200	346	693	159	1,280
				HRSD-124	-	-						
115	Newtown Rd PS	MMPS-153	Norfolk	HRSD-115	-	-	1706	10,500	2,410	3,674	1,159	6,521
				PS-039	-	-						
				PS-065	-	-						
			Virginia Beach	7	Yes	1706						
116	Norchester PS	GFM-28A, 28B, 28C, 28D	Norfolk	HRSD-116	-	449	2901	3,500	2,822	5,645	1,340	4,796
				HRSD-125	-	-						
				HRSD-130	-	-						
				HRSD-147	-	224						
				HRSD-148	-	-						
				PS-026	-	286						
				PS-031	-	15						
				PS-043	-	40						

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				PS-051	-	210						
				PS-052	-	117						
				PS-066	-	274						
				PS-072	-	281						
				PS-073	-	37						
				PS-081	-	-						
				PS-091	-	821						
				PS-094	-	54						
				PS-095	-	21						
				PS-115	-	12						
				PS-132	-	53						
PS-135	-	7										
117	North Shore Rd PS	MMPS-155	Norfolk	HRSD-117	-	-	NA	800	113	227	156	1,017
				PS-086	-	-						
118	Norview Ave PS	MMPS-156	Norfolk	HRSD-118	-	-	208	350	0	0	113	607
				PS-048	-	208						
119	Park Ave PS	MMPS-005	Chesapeake	4	Yes	145	3,234	3,600	1,440	2,879	1,001	4,385
				5	Yes	158						
				6	No	46						
				7	Yes	396						
				8	Yes	57						
				76	No	2						

**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				81	Yes	32						
				115	No	61						
				132	No	789						
				139	No	6						
				140	Yes	3						
				240	No	17						
				910	Yes	327						
				919	Yes	1195						
121	Plume St PS	MMPS-161	Norfolk	HRSD-121	-	-	695	8680	199	510	602	2,554
				PS-098	-	692						
				PS-129	-	3						
122	Powhatan Ave PS	MMPS-162	Norfolk	HRSD-122	-	222	375	800	0	0	140	1,125
				PS-112	-	21						
				PS-113	-	97						
				PS-114	-	35						
123	Quail Ave PS	GM-24	Chesapeake	9	Yes	465	1,597	2300	0	0	348	2,503
				36	Yes	50						
				42	No	144						
				83	Yes	228						
				166	No	8						
				923	Yes	702						

**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
124	Richmond Crescent PS	GFM-39, 39A	Norfolk	HRSD-124	-	-	NA	600	0	0	104	855
125	Seay Ave PS	MMPS-170	Norfolk	HRSD-125	-	-	328	1000	33	66	160	822
				PS-066	-	274						
				PS-094	-	54						
127	State Street PS	MMPS-172	Chesapeake	1	No	591	2,611	8,400	5,647	8,470	641	5,593
				39	Yes	490						
			Norfolk	HRSD-127	-	636						
				PS-035	-	249						
				PS-060	-	294						
				PS-134	-	351						
128	Steamboat Creek PS	MMPS-173	Norfolk	HRSD-128	-	148	186	1700	521	1,043	78	3,180
				PS-080	-	35						
				PS-122	-	3						
129	Taussig Blvd PS	MMPS-175	Norfolk	PS-019	-	-	NA	10390	0	0	960	7,178
130	Virginia Beach Blvd PS	MMPS-177	Norfolk	HRSD-130	-	-	327	3000	0	0	180	1,542
				PS-051	-	210						
				PS-052	-	117						
				PS-095	-	-						
131	Washington District	MMPS-178	Chesapeake	11	Yes	215	1,041	6,500	3,754	6,084	527	2,510
				13	No	66						
				22	Yes	70						

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				56	No	122						
				241	No	48						
				909	Yes	246						
				931	Yes	274						
132	Willoughby Ave PS	MMPS-182	Norfolk	HRSD-132	-	-	70	1000	860	1,720	144	2,053
				PS-006	-	70						
135	Suffolk PS	GFM-27	Suffolk	PS010	Yes	410	2,731	4,700	2,568	5,135	771	3,078
				PS011	Yes	90						
				PS021	Yes	-						
				PS022	Yes	-						
				PS027	Yes	-						
				PS030	Yes	42						
				PS036	Yes	121						
				PS042	Yes	-						
				PS055	Yes	215						
				PS064	Yes	-						
				PS065	Yes	-						
				PS096	Yes	5						
				PS112	Yes	21						
				SC01-G	Yes	163						
SC02-G	Yes	33										
SC03-G	Yes	777										



**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				SC04-G	Yes	422						
				SC05-G	Yes	432						
141	Hanover Ave PS	GFM-40	Norfolk	HRSD-141	-	-	NA	300	0	0	53	440
142	Jamestown Crescent PS	GFM-41	Norfolk	HRSD-142	-	-	NA	300	0	0	55	354
144	Elmhurst Lane PS	MMPS-131	Portsmouth	5	No	5	2,738	6,000	6,699	10,049	696	3,641
				11	No	339						
				23	No	850						
				24	No	3						
				25	No	137						
				26	Yes	1380						
67	No	24										
145	Rodman Ave PS	MMPS-167	Portsmouth	9	Yes	943	4,711	6,600	3,052	4,578	788	5,059
				15	Yes	9						
				16	Yes	232						
				19	Yes	877						
				20	Yes	54						
				21	Yes	314						
				22	No	1378						
				27	No	357						
				28	No	247						
				45	No	170						
59	Yes	40										

**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				66	No	90						
146	Camden Ave PS	MMPS-121	Portsmouth	4	Yes	3366	6,922	8400	0	0	1,553	7,130
				10	Yes	1666						
				12	No	460						
				13	Yes	578						
				14	No	235						
				17	Yes	394						
				18	Yes	68						
				53	No	112						
				62	No	32						
				64	No	11						
147	Chesterfield PS	MMPS-124	Norfolk	HRSD-147	-	224	517	600	0	0	NA	NA
				PS-026	-	286						
				PS-135	-	7						
148	Ingleside Rd PS	MMPS-141	Norfolk	HRSD-148	-	-	12	600	0	0	30	303
				PS-115	-	12						
201	25th St	MMPS-110	Newport News	HRSD 201****	Yes	304	NA	1500	139	208	144	1,127
202	33rd St	MMPS-111	Newport News	HRSD 202****	Yes	1119	NA	3000	0	0	644	5,454
203	Bay Shore Ln PS	MMPS-116	Hampton	30	Yes	164	987	2,475	1,265	2,530	258	1,543
				32	Yes	277						
				203H	Yes	546						

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
204	Bloxoms Corner PS	MMPS-118	Hampton	33	Yes	299	1,342	520	0	0	113	834
				44	Yes	254						
				45	Yes	18						
				46	Excluded	-						
				47	Yes	99						
				48	Yes	270						
				51	Yes	123						
				204H	Yes	279						
206	Bridge Street PS	MMPS-120	Hampton	3	Yes	38	7,163	10,900	11,401	17,101	2,769	9,625
				4	Yes	48						
				5	Yes	68						
				6	Yes	299						
				7	Yes	262						
				11	Yes	849						
				12	Yes	260						
				13	Yes	96						
				14	Yes	211						
				15	Yes	28						
				16	Yes	124						
				25	Yes	8						
				27	Yes	712						
				30	Yes	163						
31	Yes	421										

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				32	Yes	276						
				203H	Yes	546						
				206H	Yes	725						
				223H	Yes	1362						
				225H	Yes	667						
207	Center Avenue	MMPS-020	Newport News	HRSD 212	Yes	52	1,566	4,775	2,138	4,537	390	2,249
				HRSD 207****	Yes	1504						
				PS 099	No	10						
208	Claremont PS	GFM-6,6C,6D	Hampton	1	No	335	5,345	7000	0	0	1,163	5,049
				2	Yes	35						
				17	Yes	210						
				98	Yes	3						
				101	Yes	87						
				102	Yes	505						
				105	No	154						
				106	Yes	581						
				107	Yes	364						
				111	Yes	226						
				112	Yes	40						
				164	Yes	1						
208H	Yes	2804										
209	Copeland Park PS	MMPS-011	Hampton	100	Yes	77	2,659	5400	0	438	768	3376

**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				103	Yes	12						
				104	Yes	224						
				113	Yes	734						
				114	No	394						
				115	Yes	964						
				209H	Yes	119						
			Newport News	PS 004	Yes	135						
210	Ferguson Park	GFM-56	Newport News	PS 011	Yes	497	497	450	286	572	47	255
211	Hampton Inst	Removed	Hampton	None	-	-	NA	800	0	0	***	***
212	Hilton School PS	GFM-57A,57B	Newport News	**	**	**	NA	350	0	0	25	798
213	Jefferson Ave PS	GFM-58,58A,58B	Newport News	PS 145	No	*	NA	1780	0	0	901	3,252
214	Kingsmill PS	MMPS-024	James City Co.	LSA2-5	Yes	228	1,720	6,000	3,465	5,197	1,149	5,355
				LSA2-6	No	190						
				LSA2-7	No	250						
				LSA2-8	No	69						
				LSA2-9	No	186						
				LSA6-7	No	211						
				LSA6-9	Yes	307						
				LSA7-4	No	59						
				LSA7-6	No	28						
LSA7-7	No	61										

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				LSA7-8	No	46						
				LSA8-6	No	61						
				LSA9-4	No	24						
216	Lucas Creek PS	GFM-80A,80B	Newport News	HRSD 216	Yes	575	575	13700	886	3,423	119	558
217	Langley Circle PS	MMPS-145	Hampton	22	Yes	266	1,535	9,000	8,709	13,330	1,470	3,815
				23	Yes	543						
				24	Yes	49						
				28	Yes	14						
				34	Yes	71						
				35	No	204						
217H	Yes	388										
218	Morrison Ave PS	MMPS-151	Newport News	HRSD 218	Yes	1581	1,581	1500	463	926	398	1,261
219	Newmarket Creek PS	MMPS-152	Hampton	127	No	744	7,129	3400	0	0	1,653	4,353
				131	Yes	605						
				132	Yes	387						
				142	Yes	168						
				146	No	580						
				151	Yes	476						
				159	Yes	43						
				162	Yes	38						
				163	Yes	41						
165	Excluded	-										

**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				219H	Yes	2473						
				Newport News	HRSD 219	Yes						
220	Normandy Ln PS	MMPS-154	Newport News	HRSD 220	Yes	108	108	600	0	0	196	3,226
				PS 092	No	-						
				PS 097	No	-						
				PS 121	No	-						
221	Patrick Henry PS	GFM-61	Newport News	HRSD 221	Yes	2230	2,230	3,700	4,231	8,462	605	3,903
223	Washington St PS	GFM-9A,9B,9C	Hampton	3	Yes	38	2,033	3000	0	0	681	3,456
				12	Yes	260						
				14	Yes	211						
				15	Yes	29						
				16	Yes	125						
				25	Yes	8						
				223H	Yes	1362						
224	Woodland Rd	MMPS-183	Hampton	37	No	336	2,193	3600	0	0	547	2,053
				38	Yes	9						
				41	Yes	220						
				42	Yes	217						
				43	Yes	243						
				224H	Yes	1168						
225	Willard Ave PS	GFM-12	Hampton	4	Yes	49	4,414	5750	0	0	1,893	5,607
				5	Yes	68						

**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				6	No	299						
				7	Yes	262						
				11	Yes	850						
				13	Yes	97						
				27	Yes	713						
				30	Yes	164						
				31	Yes	422						
				32	Yes	277						
				203H	Yes	546						
				225H	Yes	667						
226	Williamsburg PS	MMPS-181	Williamsburg	12A-8	Yes	71	2,380	5,600	7,232	10,848	408	2,299
				12A-9	Yes	59						
				226A-5	No	1581						
				226A-6	Yes	669						
227	Fort Eustis	MMPS-025	Newport News	None	-	-	-	2,736	2,535	3,803	302	1,734
229	Colonial Williamsburg PS	MMPS-026	Williamsburg	229A-1	Yes	381	3,343	4,500	4,398	6,597	559	3,020
				229A-3	No	1314						
				229B-2	Yes	348						
				229B-4	Yes	547						
			York County	229	Yes	753						
230	Rolling Hills	MMPS-168	York County	230	Yes	345	345	1,400	1,122	1,682	107	1,333
231	Ford's Colony	MMPS-134	James City	LSA1-5	Yes	4005	4,671	5,000	6,412	10,023	1,086	4,237



**Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)**

HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
			Co.	LSA5-5	Yes	452						
				LSA5-9	Yes	54						
				LSA7-2	No	160						
232	Greensprings	MMPS-136	James City Co.	LSA1-1	No	846	5,524	5,200	8,362	12,611	667	3,871
				LSA1-2	Yes	3283						
				LSA1-8	Yes	214						
				LSA1-9	Yes	183						
				LSA2-1	Yes	45						
				LSA2-2	Excluded	-						
				LSA4-7	Yes	147						
				LSA5-7	Yes	14						
				LSA7-1	Yes	85						
				LSA8-2	Yes	50						
				LSA8-4	Yes	192						
				LSA8-5	Yes	51						
				LSA8-7	Yes	82						
				LSA8-8	No	99						
				LSA8-9	Yes	57						
				LSA9-2	Yes	36						
				LSA9-6	Yes	140						
233	Lodge Road	MMPS-245	James City Co.	LSA5-4	Yes	559	2,767	3600	974	1,462	352	2,069
			York County	1	Yes	160						

Table B-9. Comparison of Locality Peak Flow Thresholds and Flow Data to Firm Pumping Capacity (REVISED APRIL 24, 2013)												
HRSD PS No.	HRSD PS Name	HRSD Flow Mon ID	Locality	Locality Service Area/ Basin ID/ Name <sup>1</sup>	Designated SSES Basis by Locality	Locality-Peak-Flow-Threshold (gpm) <sup>1</sup>	Total Peak Flow Threshold for HRSD PS (gpm) <sup>1</sup>	PS Design Firm Capacity (gpm)	PS Firm Capacity at Pressure Policy (gpm)	PS Max Capacity at Pressure Policy (gpm)	Average Daily Flow (gpm)	Peak Hour Flow (gpm)
				3	Yes	187						
				4	Yes	17						
				5	Yes	36						
				6	Yes	367						
				7	Yes	68						
				8	Yes	39						
				9	Yes	154						
				65	Yes	148						
				66	Yes	44						
				HRSD Lodge Rd PS	Yes	988						

<sup>1</sup>Information provided by Localities.

\*Service Area delineated in SSES Plan included flows outside of HRSD Pump Station Service Area

\*\*HRSD's Hilton School PS was included in the service area tributary to Center Avenue PS by Newport News

\*\*\*Flow meter removed

\*\*\*\*Basin Name updated since PCAR

NA=Not Available

**Table B-10. Pumping Facility Assets that Present Material Risk of Failure**

HRSD PS Number	HRSD PS Name	Condition Assessment Findings that Present Material Risk of Failure	Rehab Plan Project Number
101	Arctic Ave	The station uses Flomatcher pump controls which are no longer manufactured. Support and replacement parts for this equipment are difficult to obtain.	GN-R6
102	Ashland Circle	The pump station was shown to have potential for flooding.	VIP-R11
103	Bainbridge Blvd	The pump station's wet well is deteriorating.	GN-R3
105	Chesapeake Blvd	Station pumps are aging and replacement parts are not available. There is a diesel driven standby pump to augment pumping capability.	VIP-R11
106	City Park	Station pumps are aging and replacement parts are not available. There is a diesel driven standby pump to augment pumping capability.	VIP-R11
108	Dovercourt Rd	The pump station's wet well intermediate deck is deteriorating.	GN-R3
109	Dozier's Comer	The pump station was shown to have potential for flooding.	AT-R6
110	Ferebee	The pump station's wet well is deteriorating; the station has experienced reliability issues. The pump station was shown to have potential for flooding.	VIP-R6
111	Granby St	The pump station was shown to have potential for flooding.	VIP-R12
112	Independence Blvd	The station uses Flomatcher pump controls which are no longer manufactured. Support and replacement parts for this equipment are difficult to obtain.	CE-R4
113	Luxembourg Ave	The pump station structure is experiencing differential settlement and the wet well is deteriorating.	VIP-R11
114	Monroe Place	The pump station was shown to have potential for flooding.	VIP-R10
115	Newtown Rd	The pump station's wet well is deteriorating.	GN-R3
115	Newtown Rd	The station uses Flomatcher pump controls which are no longer manufactured. Support and replacement parts for this equipment are difficult to obtain.	GN-R6
117	North Shore Rd	The pump station's wet well is deteriorating.	GN-R3
118	Norview Ave	The pump station's wet well is deteriorating.	GN-R3
119	Park Ave	The pump station has experienced reliability issues.	VIP-R3
122	Powhatan Ave	The pump station has experienced pump related maintenance issues. As part of a network of pump stations, include along with the other stations for project VIP-R10.	VIP-R10
124	Richmond Crescent	The pump station was shown to have potential for flooding.	VIP-R10
124	Richmond Crescent	The station SCADA panel is corroding.	VIP-R10
127	State St	The station uses Flomatcher pump controls which are no longer manufactured. Support and replacement parts for this equipment are difficult to obtain. There have also been issues of overheating of the pump station electrical components.	VIP-R4
129	Taussig Blvd	The bubbler panel is deteriorating and shows signs of previous fire damage.	AB-R1
130	Virginia Beach Blvd	The pump station's wet well is deteriorating.	GN-R3
131	Washington District	The pump station's wet well is deteriorating.	GN-R3
131	Washington District	The pump station was shown to have potential for flooding.	AT-R7
132	Willoughby Ave	The pump station's wet well is deteriorating.	GN-R3
135	Suffolk	The station uses Flomatcher pump controls which are no longer manufactured. Support and replacement parts for this equipment are difficult to obtain.	HRSD CIP No. NA-106-2
141	Hanover Ave	The pump station was shown to have potential for flooding. Additionally, the wet well is experiencing deterioration.	VIP-R10

**Table B-10. Pumping Facility Assets that Present Material Risk of Failure**

HRSD PS Number	HRSD PS Name	Condition Assessment Findings that Present Material Risk of Failure	Rehab Plan Project Number
142	Jamestown Crescent	The pump station was shown to have potential for flooding. Additionally, the wet well is experiencing deterioration.	VIP-R10
143	Shipp's Comer	Two of the four pumps are inoperable. Portable pumps are located at the station to augment pumping capability. The station uses Flomatcher pump controls which are no longer manufactured. Support and replacement parts for this equipment are difficult to obtain.	AT-R3
145	Rodman Ave	The pump station's wet well is deteriorating.	Prompt Repair Program
148	Ingleside	The wet well is experiencing deterioration.	VIP-R8
203	Bay Shore Lane	The MCC is deteriorating and there is evidence of a previous MCC fire. Additionally, the Bayshore Lane generator has experienced problems with overheating.	BH-R7
204	Bloxom's Corner	The pump station's wet well is deteriorating.	GN-R3
209	Copeland Park	Operational difficulties necessitate replacement of the MCC.	BH-R7
219	Newmarket Creek	The station transfer switch is corroded and did not readily transfer during preventive maintenance activities. MCC has experienced operational difficulties.	BH-R7
227	Ft Eustis	The existing wet well influent channel configurations has resulted in corrosion, odor and operational issues.	GN-R12
231	Ford's Colony	The pump station's wet well is deteriorating.	GN-R3
232	Greensprings	The existing wet well influent channel configurations has resulted in corrosion, odor and operational issues.	GN-R12
233	Lodge Rd	The existing wet well influent channel configurations has resulted in corrosion, odor and operational issues.	GN-R12

**Table B-11 Calculated Emergency Response Times (Added February 2014)**

Pump Station Number	PS Name	Locality	Address	Total Anticipated Response Time (ART) (Mins)	Critical Response Time (CRT) High Level Alarm to Overflow, pumps off (mins) - 2 year- LOS	Is ART Less Than CRT?
118	Norview Ave	Norfolk	869 Norview Avenue, Norfolk	98	25	NO
121	Plume St	Norfolk	236 E. Plume Street, Norfolk	104	140	YES
122	Powhatan Ave	Norfolk	1548 Buckingham Avenue, Norfolk	106	15	NO
130	Virginia Beach Blvd	Norfolk	3514 E. Virginia Beach Blvd, Norfolk	97	20	NO
132	Willoughby Ave	Norfolk	1912 Willoughby Avenue, Norfolk	98	12	NO
141	Hanover Ave	Norfolk	900 Hanover Avenue, Norfolk	105	15	NO
142	Jamestown Crescent	Norfolk	858 Jamestown Crescent, Norfolk	106	10	NO
147	Chesterfield Blvd	Norfolk	2731 Chesterfield Blvd, Norfolk	99	30	NO
148	Ingleside Rd	Norfolk	600 Ingleside Road, Norfolk	103	35	NO

**Table B-12 List of Portable Pumps and Generators (Added February 2014)**

<b>Portable Pumping Equipment</b>				
<b>Location</b>	<b>Quantity</b>	<b>Make / Series</b>	<b>Size (in)</b>	<b>Capacity Range (gpm)</b>
North Shore Operations Center	1	Godwin / CD100M	4"	100-750
North Shore Operations Center	4	Godwin / CD150M	6"	700-2,080
North Shore Operations Center	2	Godwin / CD225M	8"	1,000-3,100
North Shore Operations Center	1	Godwin / HL250	12"	2,500-5,200
North Shore Operations Center	1	Godwin / CD300M	12"	3,000-6,000
South Shore Operations Center	1	Godwin / CD100M	4"	100-750
South Shore Operations Center	2	Godwin / CD150M	6"	700-2,080
South Shore Operations Center	1	Godwin / CD225M	8"	1,000-3,100
South Shore Operations Center	1	Godwin / CD300M	12"	3,000-6,000
<b>Portable Generators</b>				
<b>Location</b>	<b>Quantity</b>	<b>Size (kW)</b>		
North Shore Operations Center	1	150		
North Shore Operations Center	1	250		
South Shore Operations Center	1	20		
South Shore Operations Center	2	30		
South Shore Operations Center	3	100		
South Shore Operations Center	1	350		
South Shore Operations Center	1	450		

**Table B-13 List of Reserve Pumps used for Continuous Operability (Added February 2014)**

Pump Station Number	Pump Station Name	Pump Make / Series	Size (in)	Capacity at Pressure Policy (gpm)
106	City Park	Godwin / CD150M	6"	1,825
125	Seay Ave	Godwin / CD150M	6"	1,825
102	Ashland Circle	Godwin / CD150M	6"	1,825
109	Dozier's Corner	Godwin / CD150M	6"	1,775
114	Monroe Place	Godwin / CD225M	8"	2,850

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## Section 6

# Pump Station Facility Inspection Results Summary

Section 6 presents a summary of pumping facility inspections organized by pump station number. The methodology of the pump station inspections and asset scoring including Condition and Performance (C & P) Regions is explained in Section 3.

This section is devoted to summarizing the results of each pump station field inspection. The pump stations are in order of HRSD PS number. The stations have the following information reported:

- A Vicinity map;
- Station Photo;
- Summary table which provides a description of the pumping facility;
- Inspection results summary table with condition and performance scores;
- Results of PS draw down testing (if applicable);
- Assets of interest (if applicable);
- Lightning strike evaluation results;
- Grounding system diagram;
- History of failures related to dual-feed power supplies or lightning strike (if applicable); and
- A dual-feed assessment (if applicable).

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## Inspection Results by Pumping Facility

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## PS 101 Arctic Avenue Pump Station

### Arctic Avenue Facility Description



Figure 101-1. Arctic Avenue Location Map



Figure 101-2. Arctic Avenue Pump Station

<b>Table 101-1. Arctic Avenue Pump Station</b>	
Pumping Facility Number	101
Date of Initial Inspection	6/27/2008
Date of Update Inspection	6/23/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/21/2011
Date of Construction	1967
Address	2814 Arctic Ave, Virginia Beach
Receiving Facility	Atlantic Treatment Plant
Design Head	62 ft., 67 ft.
Firm Pumping Capacity	7000 GPM
Total Pumping Capacity	10500 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	3500 GPM
Standby Pump(s) present during inspection	12" Godwin CD300M
Motor Manufacturer	General Electric
Motor Nameplate Power	100 HP
Generator	None

### Arctic Avenue Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 101-2. Arctic Avenue Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
101	Arctic Avenue	Building	Building	2	1	Good	No Immediate Action Required	Slate roof. Much warmer inside compared with other stations.	1
101	Arctic Avenue	HVAC System	HVAC System	2	3	Good	Continue Scheduled Maintenance Activities	Scrubber and ozonator have been removed. Motor room fan exhausts to attic. Supply fan made noise. Could not feel flow from dry well fan. Vapex ozone generator is onsite.	2
101	Arctic Avenue	Wet well	Wet well	2	1	Good	No Immediate Action Required	T-Lock rehab in place. 5/2012: HRSD PM inspection on 05/14/2012 indicates no major changes from the 2008 wet well data.	1
101	Arctic Avenue	Motor 1	Wastewater Pump Motor and Controller	3	1	Vibrates	Continue Scheduled Maintenance Activities	Motor 1. Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes.	2
101	Arctic Avenue	Motor 2	Wastewater Pump Motor and Controller	3	1	Makes Noise	Continue Scheduled Maintenance Activities	Motor 2. Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Makes noise.	2
101	Arctic Avenue	Motor 3	Wastewater Pump Motor and Controller	3	1	Vibrates	Continue Scheduled Maintenance Activities	Slight visible vibration. Single speed.	2
101	Arctic Avenue	Pump 1	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Minor shaft vibration. Lead pump on day of test. The upper portion of the pump was warm. Pump made noises. . Pumping pressure: 34 psi.	2
101	Arctic Avenue	Pump 2	Pump	3	3	Vibrating Shaft Deflection Bearing Noise	Continue Scheduled Maintenance Activities	Chatter in power frame from stuffing box to shaft coupling; frame not hot to touch. Throws water from stuffing box. Shaft made noise	2

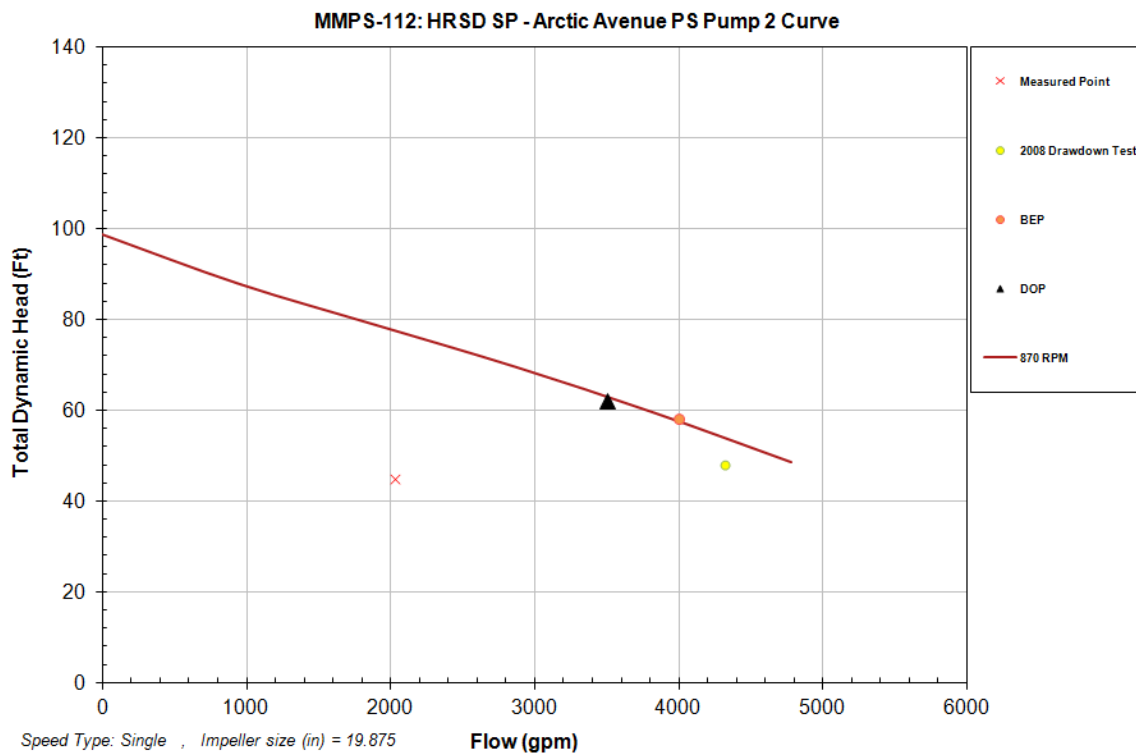
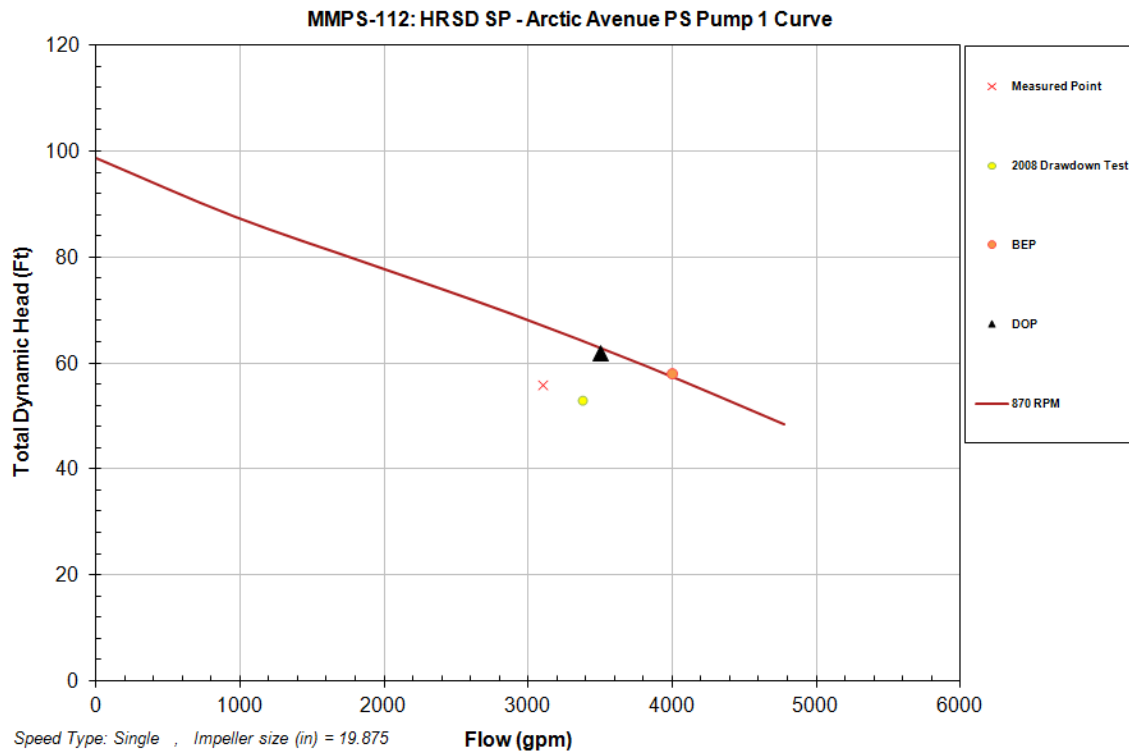
**Table 101-2. Arctic Avenue Pumping Facility Asset Condition and Performance Ratings**

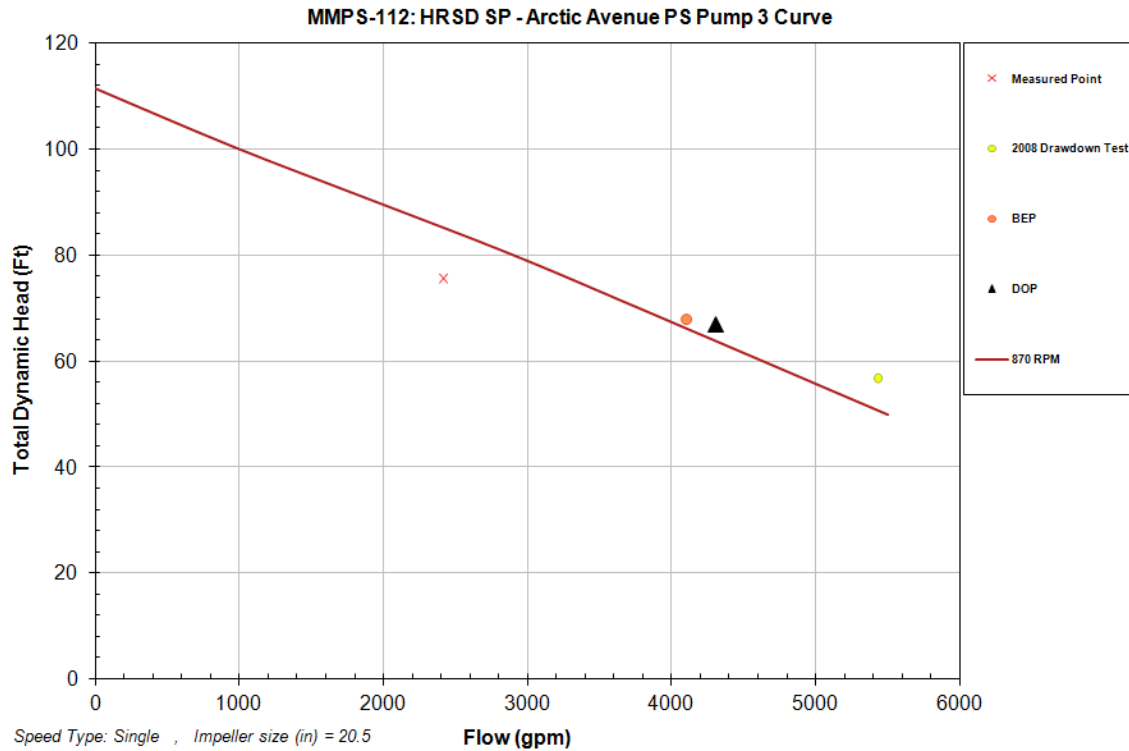
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
101	Arctic Avenue	Pump 3	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Minor shaft deflection. Pump made noise. Stuffing box throwing water. Vibration minor. Missing flange bolt underneath.	2
101	Arctic Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
101	Arctic Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
101	Arctic Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
101	Arctic Avenue	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1



Table 101-2. Arctic Avenue Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
101	Arctic Avenue	Electrical Equipment	Electrical Equipment	3	2	Good Dust Inside Panel	Continue Scheduled Maintenance Activities	Lighting panel main breaker has been improperly modified. Alternate power feed instead of standby generator.	2
101	Arctic Avenue	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Flomatcher on 1 and 2. #3 runs off bubbler system on Flomatcher. #3 is 2nd lag, constant speed. Analog gauge/ control.	2
101	Arctic Avenue	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed	Continue Scheduled Maintenance Activities	No Comment	2
101	Arctic Avenue	FLOmatcher	FLOmatcher	3	2	None to Report	Continue Scheduled Maintenance Activities	Equipment is well maintained but is old and should be considered for replacement.	2
101	Arctic Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
101	Arctic Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required		1
101	Arctic Avenue	SCADA	SCADA	1	1	No panel door grounding wire is installed. Uncapped wires loose in the panel. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
101	Arctic Avenue	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
101	Arctic Avenue	Transfer Switch	Transfer Switch	2	1	No Panel Door Grounding Wire	No Immediate Action Required	None.	1

### Draw-Down Testing





Arctic Ave PS uses variable speed Flomatcher pump controls which do not give a remote indication of pump shaft speed. The plotted curve is for the maximum pump shaft speed and, depending on available data; the measured point gives an indication of the pumps normal operating range rather than pumping capacity.

## Arctic Avenue Assets of Interest

The station uses Flomatcher pump controllers.



Figure 101-3. Arctic Avenue Pump Controllers

### Arctic Avenue Lightning Protection Field Observations:

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Velocity Profiler is not protected with surge suppression
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment Properly Grounded:
  - Velocity Profiler & MMPS are not properly bonded to the station grounding system

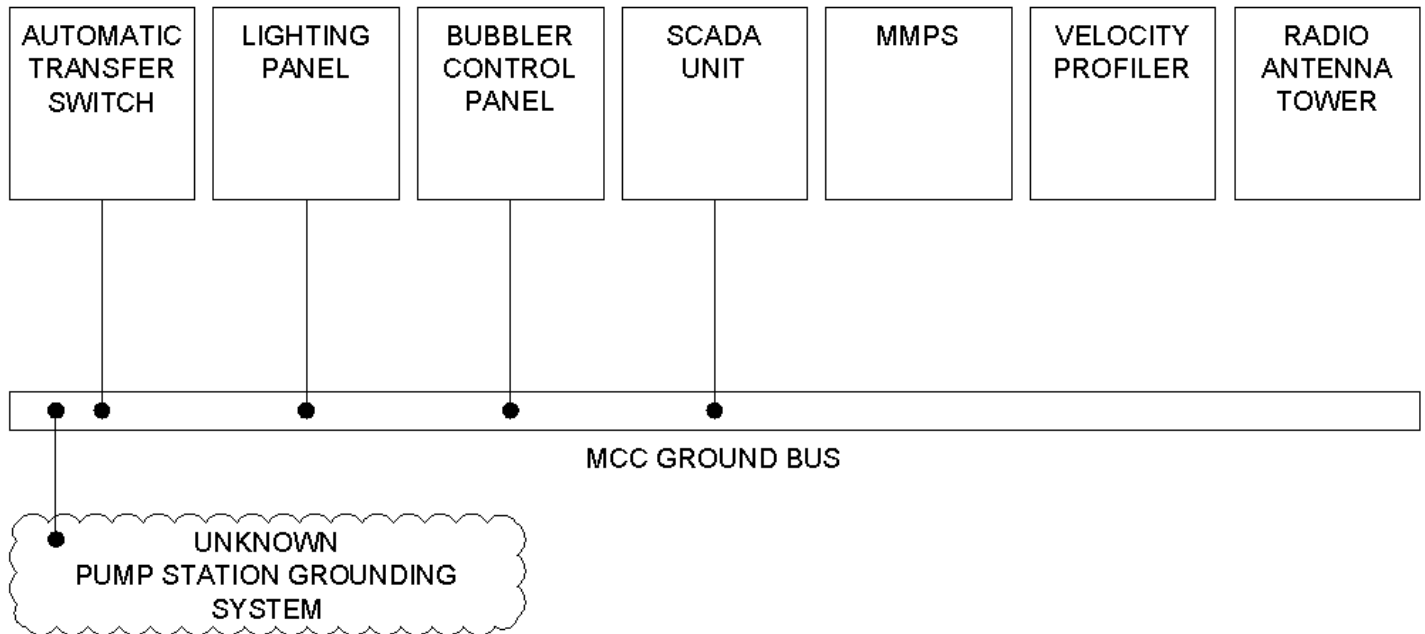


Figure 101-4. Arctic Ave Grounding System

### Arctic Avenue Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out

- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator

### **Arctic Avenue Dual Power Feed Assessment**

Information obtained from the local electrical utility indicates that this station has redundant transformers each with a different circuit feeding it from the utility. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.

## PS 102 Ashland Circle Pump Station

### Ashland Circle Facility Description



Figure 102-1. Ashland Circle Pump Station Location Map



Figure 102-2. Ashland Circle Pump Station

<b>Table 102-1. Ashland Circle PS</b>	
Pumping Facility Number	102
Date of Initial Inspection	6/22/2008
Date of Update Inspection	6/23/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/5/2011
Date of Construction	1955
Address	1402 Ashland Circle, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	60 ft.
Firm Pumping Capacity (GPM)	450 GPM
Total Pumping Capacity (GPM)	900 GPM
Number of Pumps	2
Pump Type	Direct-coupled Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	450 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M
Motor Manufacturer	Allis Chalmers
Motor Nameplate Power (HP)	10
Generator Power (KW)	None

### Ashland Circle Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



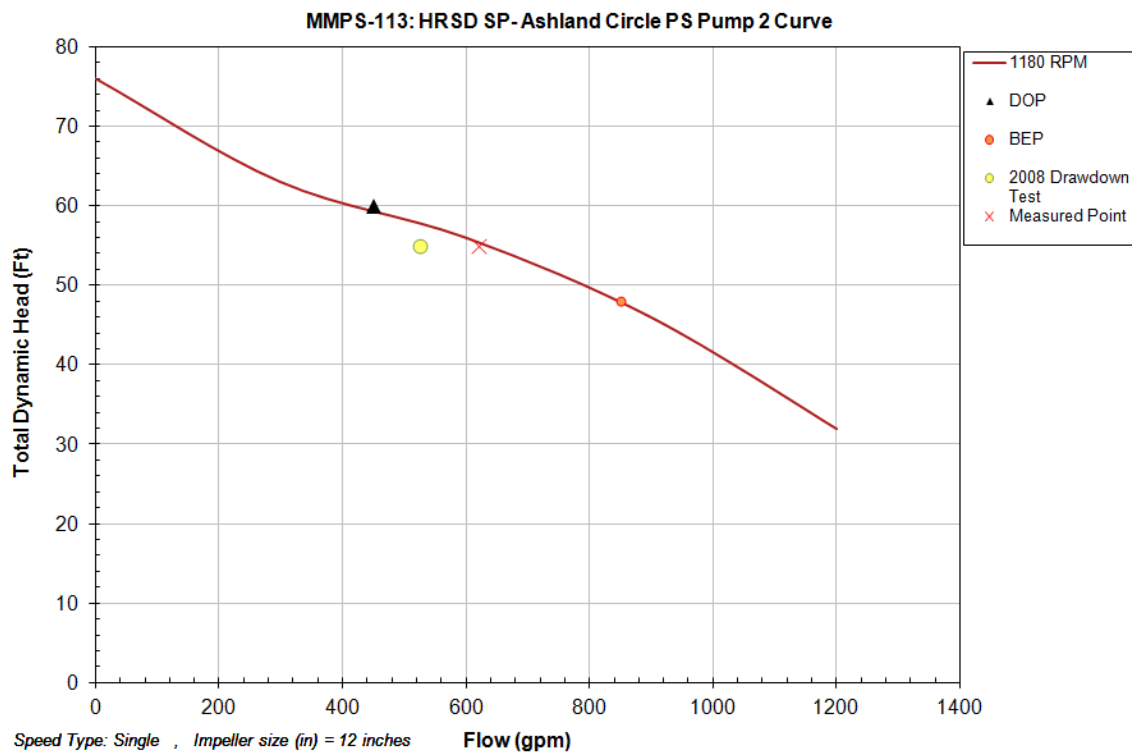
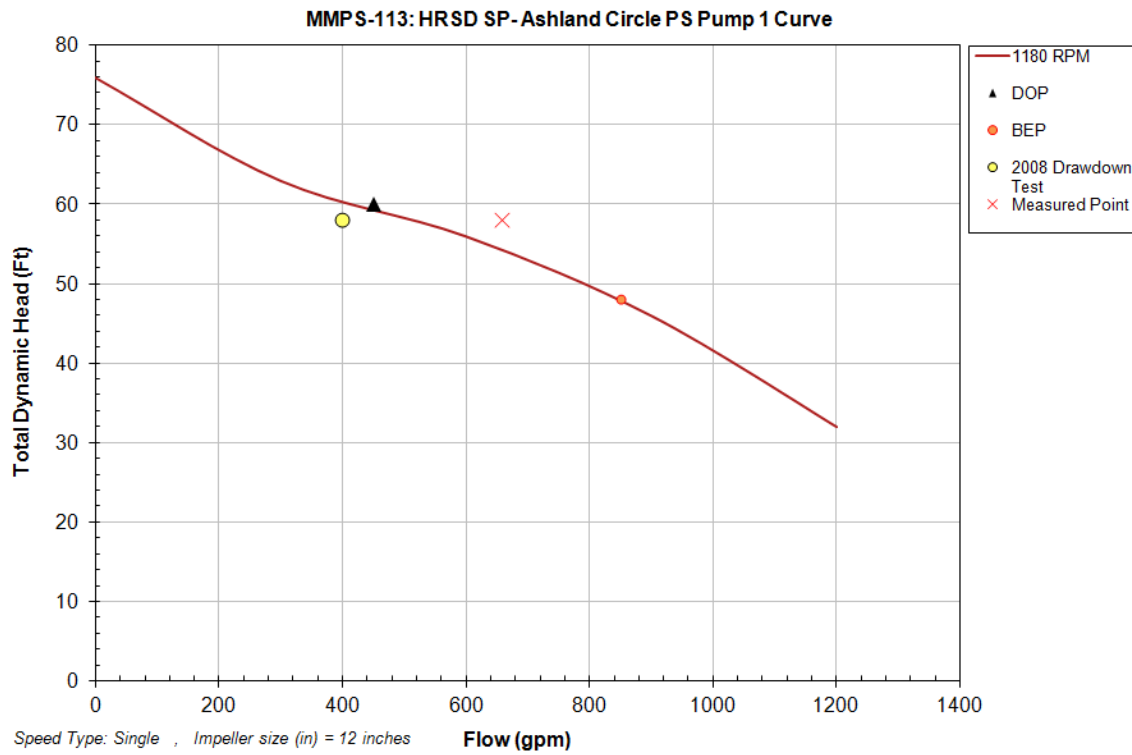
Table 102-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
102	Ashland Circle	Building	Building	2	1	Good	No Immediate Action Required	8"X6" section of concrete missing from ceiling - conduit corroded so that insulated wires are exposed. Godwin pump D62041 onsite. Ops reports water comes onto road next to station at high tide.	1
102	Ashland Circle	HVAC System	HVAC System	2	2	Good	No Immediate Action Required	Ducting is aging.	1
102	Ashland Circle	Wet well	Wet well	2	1	Good	No Immediate Action Required	5/2012: HRSD PM inspection on 03/01/2012 indicates no major changes from the 2008 wet well data.	1
102	Ashland Circle	Motor 1	Wastewater Pump Motor and Controller	2	1	Good Opposite End Bearing Noise	No Immediate Action Required	Bearing noise faint.	1
102	Ashland Circle	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
102	Ashland Circle	Pump 1	Pump	2	1	Good	No Immediate Action Required	Suction and discharge - 4". Pumps can be run in series or parallel.	1
102	Ashland Circle	Pump 2	Pump	2	1	Good Bearing Noise	No Immediate Action Required	Suction and discharge = 4". Pump made noises. Lag pump on day of inspection. Shaft bearing noise at the top end of pump. Pumps can be run in series or parallel.	1
102	Ashland Circle	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
102	Ashland Circle	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation. Check valve #2 had a slight audible slam on closure.	1
102	Ashland Circle	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
102	Ashland Circle	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
102	Ashland Circle	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 102-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
102	Ashland Circle	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
102	Ashland Circle	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
102	Ashland Circle	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
102	Ashland Circle	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete	Continue Scheduled Maintenance Activities	No automatic back up power source. Standby pump on site. No panel door ground wire is installed on the Motor starters. Lighting panel is obsolete	2
102	Ashland Circle	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Analog gauge/control	2
102	Ashland Circle	Bubbler Panel	Bubbler Panel	3	2	No panel door ground wire is installed	Continue Scheduled Maintenance Activities	No Comment	2
102	Ashland Circle	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
102	Ashland Circle	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
102	Ashland Circle	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Manual throw	1

### Draw-Down Testing



Ashland Circle PS does not have a discharge pressure sensor with remote indication. The station does not discharge to a manifolded force main so the TDH was assumed based on the results of the 2008 draw down test. The Flow is the average pumping rate.

**Ashland Circle Assets of Interest**

None.

**Ashland Circle Lightning Protection Field Observations**

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Motor starters & bubbler control panel are not bonded to the station grounding system

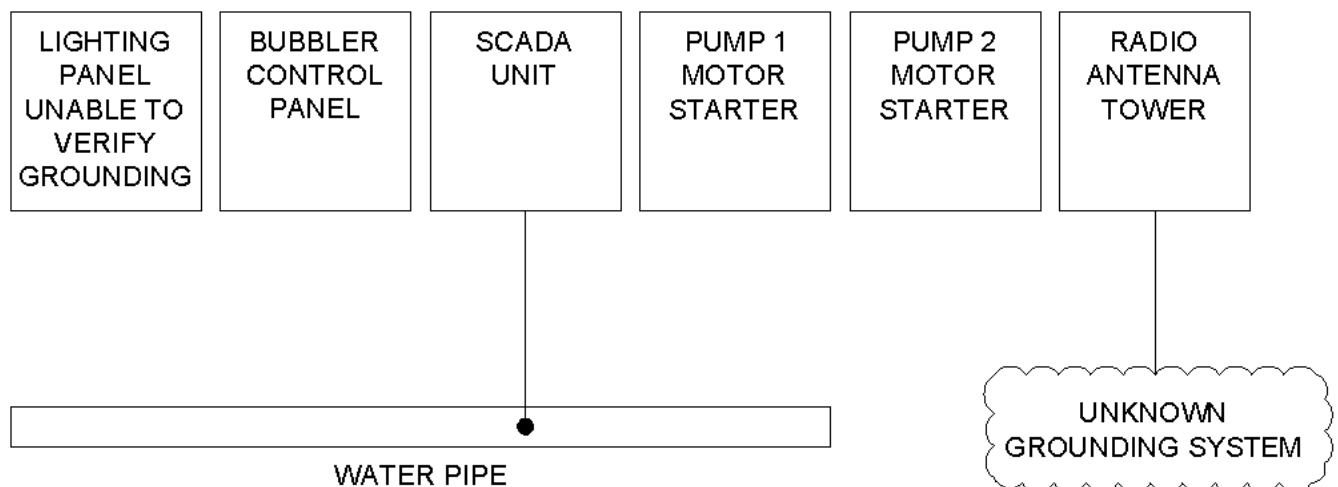


Figure 102-4. Ashland Circle Grounding System

**Ashland Circle Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)

- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 103 Bainbridge Blvd Pump Station

### Bainbridge Blvd Facility Description



Figure 103-1. Bainbridge Blvd Pump Station Location Map



Figure 103-2. Bainbridge Blvd Pump Station

<b>Table 103-1. Bainbridge Blvd PS</b>	
Pumping Facility Number	103
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/10/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	6/23/2011
Date of Construction	1948
Address	801 Bainbridge Blvd, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	55.5 ft.
Firm Pumping Capacity (GPM)	1200 GPM
Total Pumping Capacity (GPM)	2400 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1200 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric
Motor Nameplate Power (HP)	30
Generator Power (KW)	100

### **Bainbridge Blvd Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.



Table 103-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
103	Bainbridge Blvd	Building	Building	2	1	Good	No Immediate Action Required	I-Beam has been cut to allow passage of shafts. 2400 lbs cap. crane rail only - good condition.	1
103	Bainbridge Blvd	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	1/6 HP HVAC blower. Only located 1 exhaust fan.	1
103	Bainbridge Blvd	Wet well	Wet well	4	1	Concrete Spalling	Schedule Corrective Action	Some spalling on underside of intermediate deck. 5/2012: HRSD wet well inspection in 03/07/2012 indicates no major changes from the 2008 wet well data. Rating updated from contractor report.	3
103	Bainbridge Blvd	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	Pump 1	Pump	3	1	None to Report	Continue Scheduled Maintenance Activities	Could not verify nameplate information. No evidence of restrictor plate use as in 2008 inspection. Pumps run for a very short period of time.	2
103	Bainbridge Blvd	Pump 2	Pump	3	3	Shaft Deflection	Continue Scheduled Maintenance Activities	Could not verify nameplate information. No evidence of restrictor plate use as in 2008 inspection. Pumps run for a very short period of time. Pump made noise which seemed to be produced by shaft deflection.	2
103	Bainbridge Blvd	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

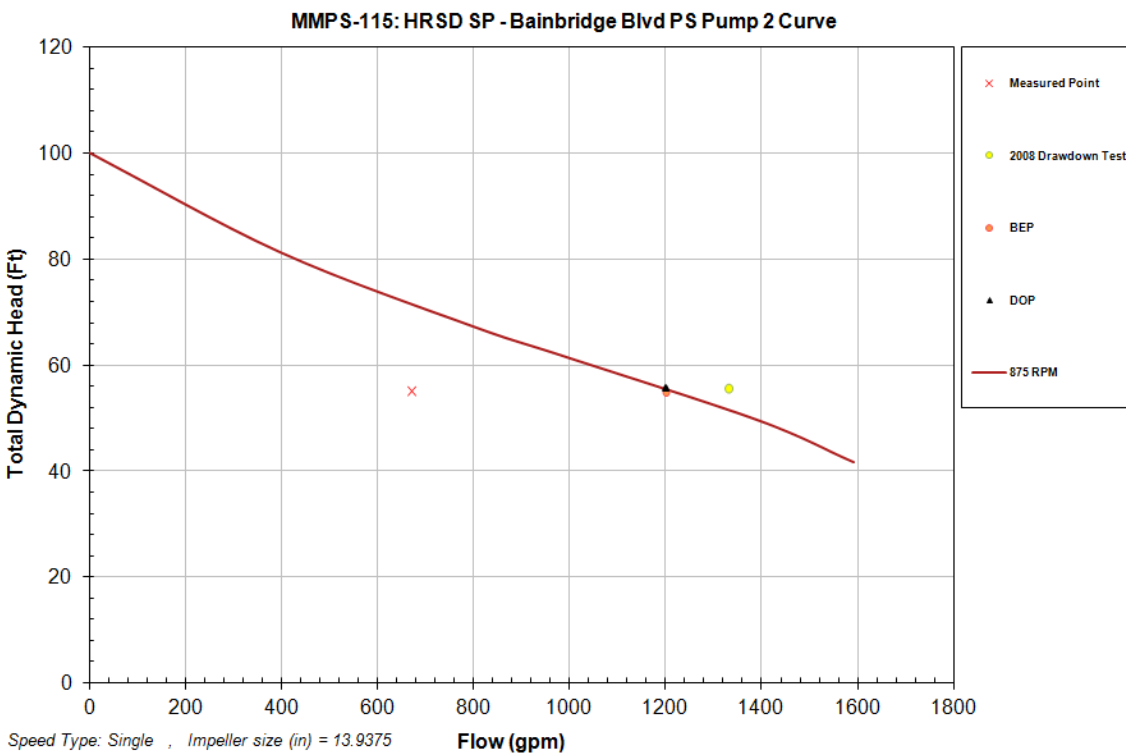
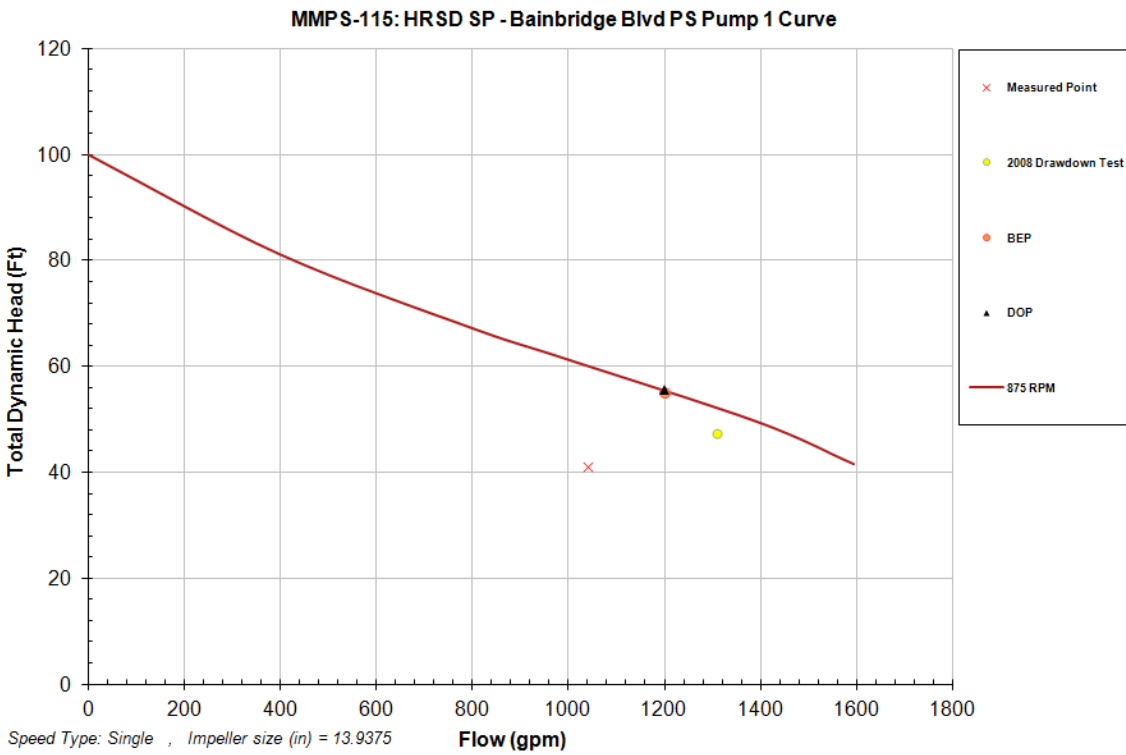
Table 103-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
103	Bainbridge Blvd	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
103	Bainbridge Blvd	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
103	Bainbridge Blvd	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
103	Bainbridge Blvd	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
103	Bainbridge Blvd	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
103	Bainbridge Blvd	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
103	Bainbridge Blvd	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
103	Bainbridge Blvd	Electrical Equipment	Electrical Equipment	3	1	Good Panel Corroded Dust Inside Panel	Continue Scheduled Maintenance Activities	Excavated conduits outside of building.	2
103	Bainbridge Blvd	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
103	Bainbridge Blvd	Bubbler Panel	Bubbler Panel	3	2	No panel door ground wire is installed	Continue Scheduled Maintenance Activities	No Comment	2
103	Bainbridge Blvd	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1

**Table 103-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
103	Bainbridge Blvd	Transfer Switch	Transfer Switch	1	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
103	Bainbridge Blvd	Tank	Fuel Tank	2	1	Good	No Immediate Action Required	Belly Tank	1

## Draw-Down Testing



### Bainbridge Blvd Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Bainbridge Blvd wet well is deteriorating.



Figure 103-3. Bainbridge Blvd Wet Well

### Bainbridge Blvd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system

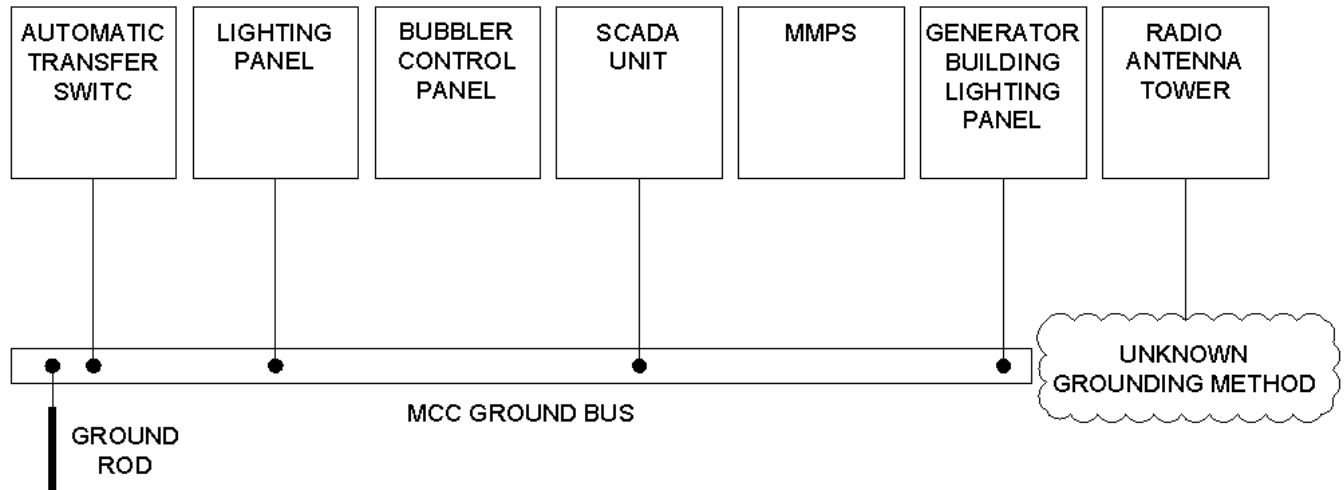


Figure 103-4. Bainbridge Blvd Grounding System

### Bainbridge Blvd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion

- Building Electrical Plans Provided
- Other

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## PS 104 Cedar Lane Pump Station

### Cedar Lane Facility Description



Figure 104-1. Cedar Lane Pump Station Location Map



Figure 104-2. Cedar Lane Pump Station

<b>Table 104-1. Cedar Lane PS</b>	
Pumping Facility Number	104
Date of Initial Inspection	7/2/2008
Date of Update Inspection	6/8/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/20/2011
Date of Construction	1962
Address	5915 Cedar Lane, Portsmouth
Receiving Facility	Nansemond Treatment Plant
Design Head (Feet)	45 ft., 65 ft.
Firm Pumping Capacity (GPM)	7400 GPM
Total Pumping Capacity (GPM)	11900 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse (2), Worthington (1)
Pump Nameplate Capacity	3400 GPM, 4000 GPM, 4500 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	U.S. Electrical Motors (1), Marathon Electric (1), Westinghouse (1)
Motor Nameplate Power (HP)	75, 75, 125
Generator Power (KW)	None

### Cedar Lane Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 104-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
104	Cedar Lane	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	Wet well	Wet well	2	1	Hatch Damaged or Difficult to open	No Immediate Action Required	No Comment	1
104	Cedar Lane	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
104	Cedar Lane	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	Pump 1	Pump	3	1	Seals Leaking	Continue Scheduled Maintenance Activities	Seals leaking more than others, but still not at problem levels.	2
104	Cedar Lane	Pump 2	Pump	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	Pump 3	Pump	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
104	Cedar Lane	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
104	Cedar Lane	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

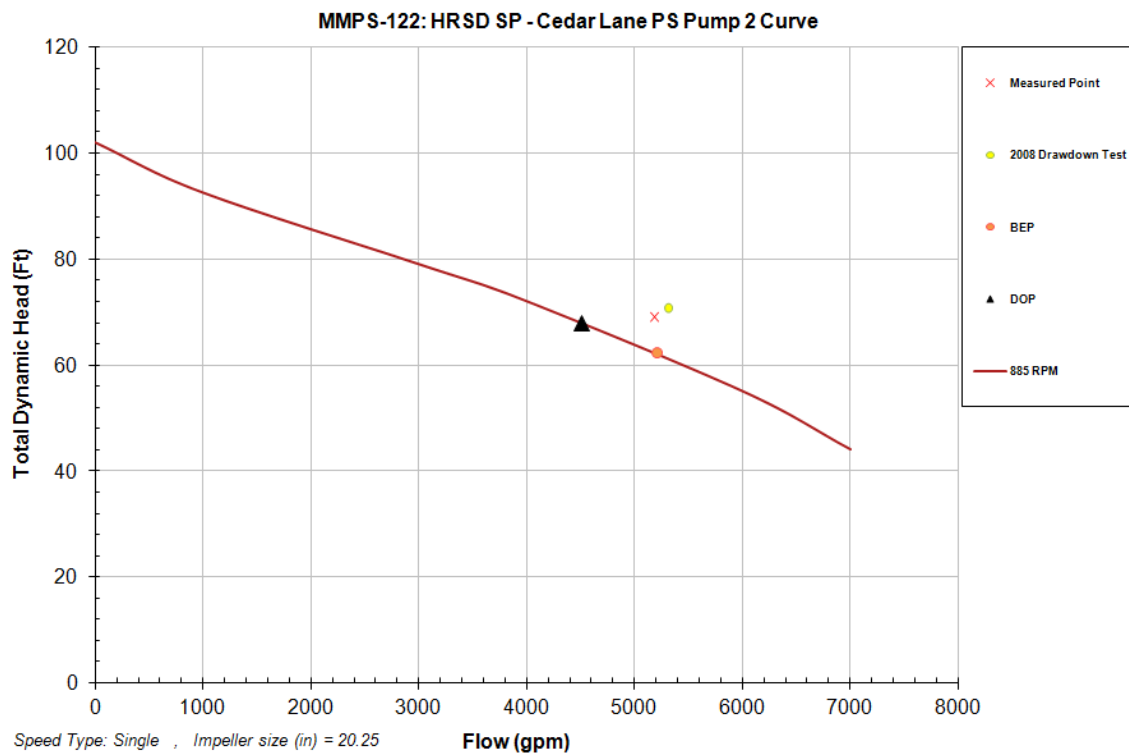
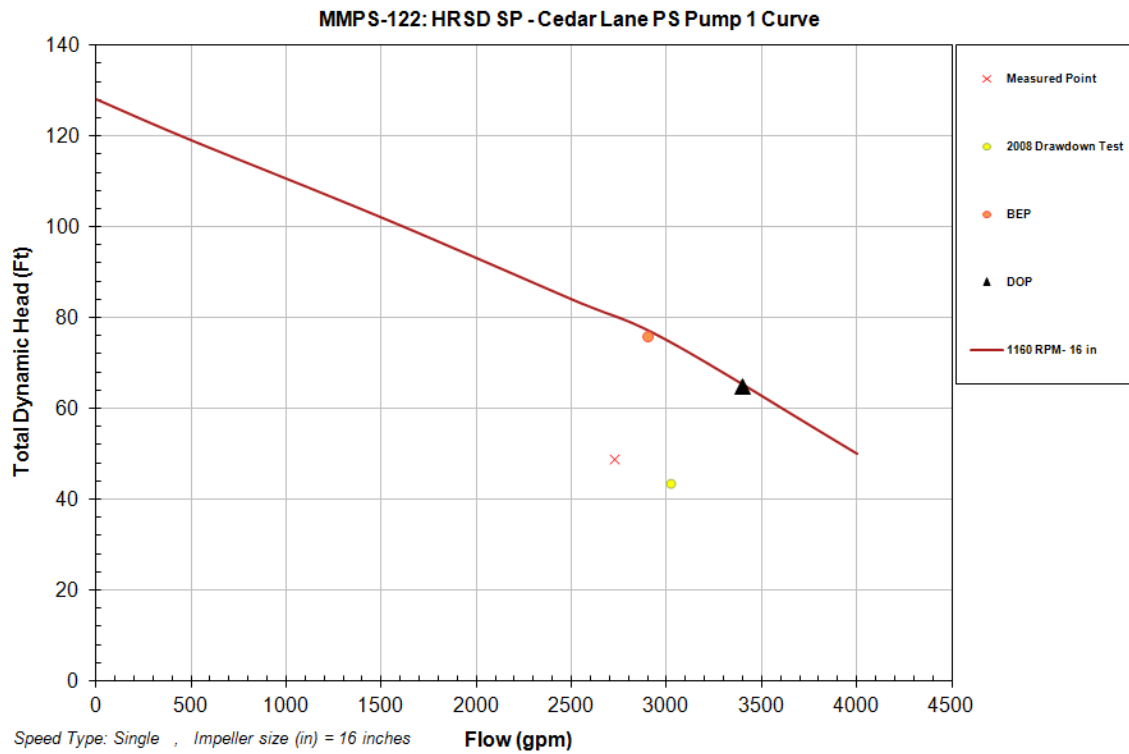
**Table 104-2. Pumping Facility Asset Condition and Performance Ratings**

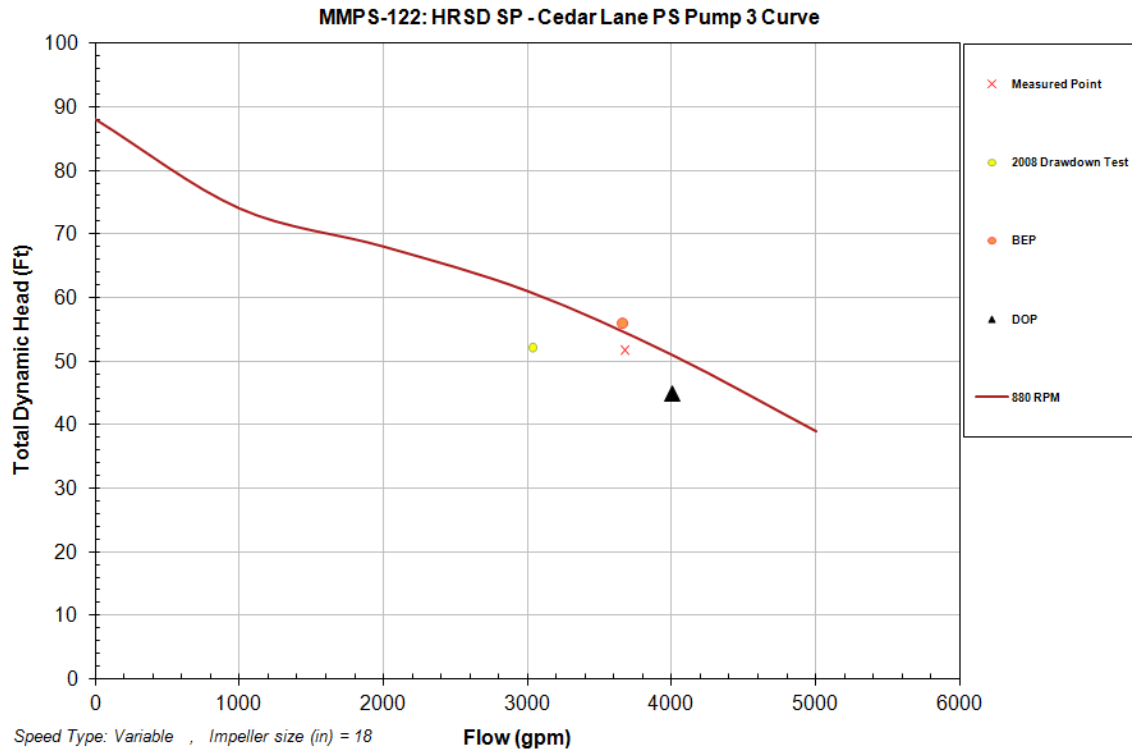
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
104	Cedar Lane	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
104	Cedar Lane	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	Alternate power feed instead of standby generator.	1
104	Cedar Lane	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
104	Cedar Lane	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed	Continue Scheduled Maintenance Activities	No Comment	2
104	Cedar Lane	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
104	Cedar Lane	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
104	Cedar Lane	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
104	Cedar Lane	SCADA	SCADA	2	1	No panel door grounding wire. Uncapped wires are present in the panel. Corrosion is forming in the panel.	No Immediate Action Required	No Comment	1

**Table 104-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
104	Cedar Lane	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
104	Cedar Lane	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1

### Draw-Down Testing





### Cedar Lane Assets of Interest

None.

### Cedar Lane Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel & velocity profiler are not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel, velocity profiler, & MMPS are not bonded to the station grounding system

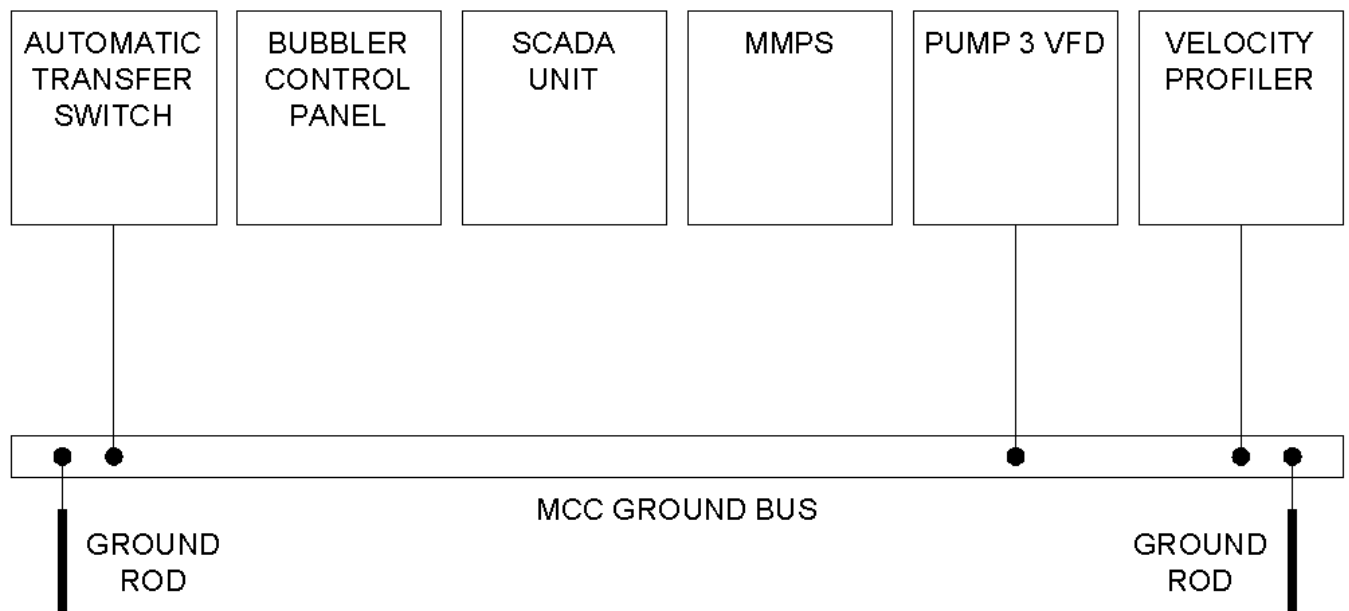


Figure 104-3. Cedar Lane Grounding System

### Cedar Lane Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel



- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator

### **Cedar Lane Dual Power Feed Assessment**

Information obtained from the local electrical utility indicates that this station has redundant transformers each with a different circuit feeding it from the utility. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.

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## PS 105 Chesapeake Blvd Pump Station

### Chesapeake Blvd Facility Description



Figure 105-1. Chesapeake Blvd Pump Station Location Map



Figure 105-2. Chesapeake Blvd Pump Station

<b>Table 105-1. Chesapeake Blvd PS</b>	
Pumping Facility Number	105
Date of Initial Inspection	6/22/2008
Date of Update Inspection	6/22/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/19/2011
Date of Construction	1954
Address	5734 Chesapeake Blvd, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	86 ft.
Firm Pumping Capacity (GPM)	4000 GPM
Total Pumping Capacity (GPM)	6400 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Aurora (2), Fairbanks Morse (1)
Pump Nameplate Capacity	2000 GPM, 2000 GPM, 2400 GPM
Standby Pump(s) present during inspection	12" Godwin CD300M 6" Godwin CD150M
Motor Manufacturer	Marathon Electric
Motor Nameplate Power (HP)	75
Generator Power (KW)	240

### Chesapeake Blvd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 105-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
105	Chesapeake Blvd	Building	Building	2	1	Good	No Immediate Action Required	2 Godwin pumps: B1720, CD150. Godwins can be run in parallel or series. Slate roof	1
105	Chesapeake Blvd	HVAC System	HVAC System	2	2	Low Detectable Airflow	No Immediate Action Required	Dry well ventilation weak. Exhaust fan 2 not found.	1
105	Chesapeake Blvd	Wet well	Wet well	2	1	Good	No Immediate Action Required	Intermediate deck was recently replaced. 5/2012: HRSD PM inspection on 01/30/2012 indicates no major changes from the 2008 wet well data.	1
105	Chesapeake Blvd	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Motor 1	Wastewater Pump Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Slight vibration.	1
105	Chesapeake Blvd	Motor 2	Wastewater Pump Motor and Controller	2	2	Good Vibrates Higher than Expected Operating Temperature	No Immediate Action Required	Motor feels warm.	1
105	Chesapeake Blvd	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Pump 1	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	No nameplate on pumps. Slight vibration likely caused by slight shaft deflection. Pump made noise.	2
105	Chesapeake Blvd	Pump 2	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	No nameplate on the pumps. Pump and shaft made noise.	2

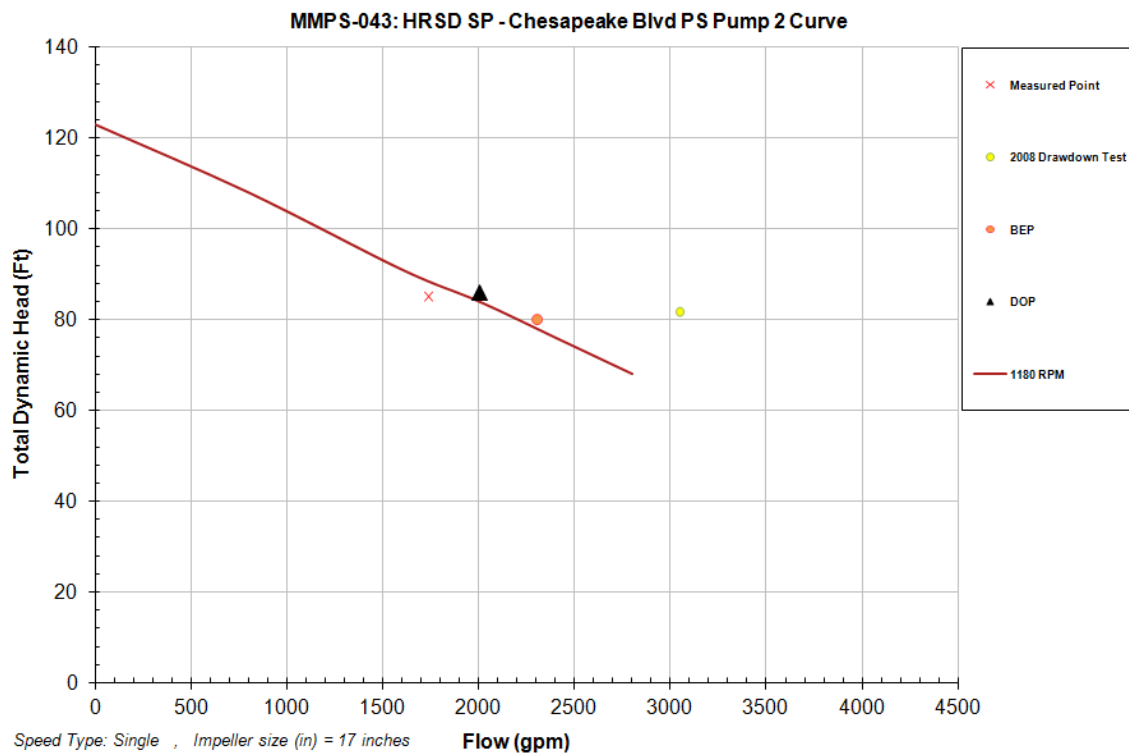
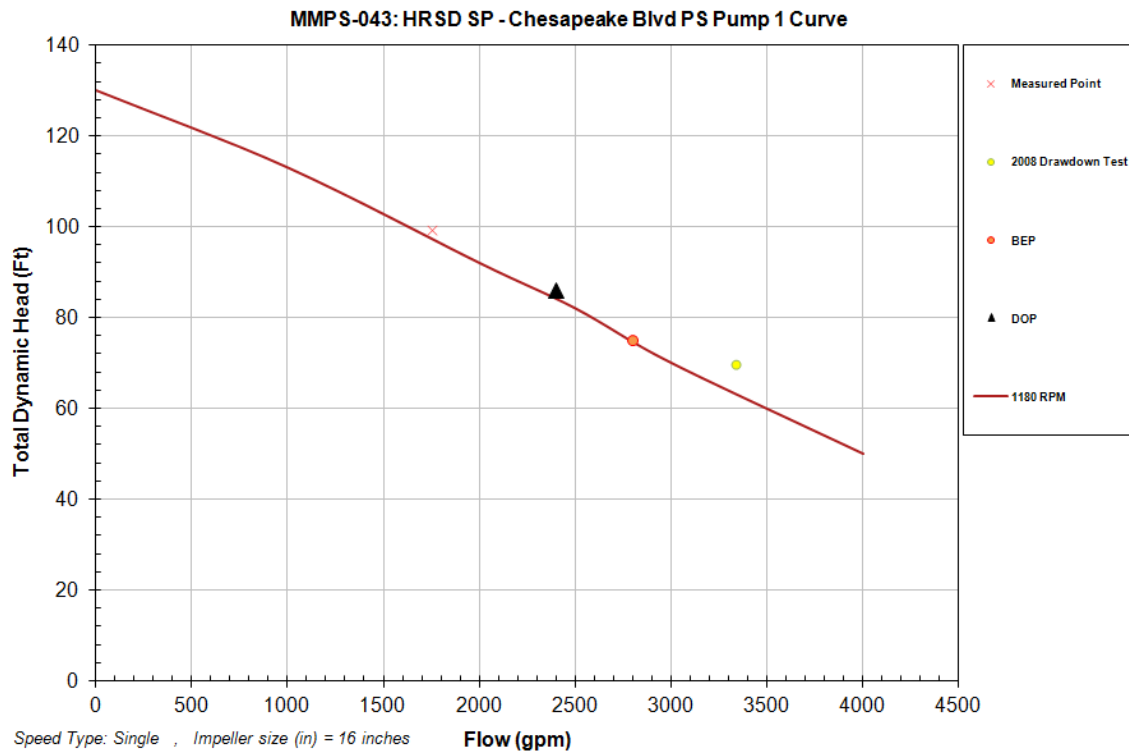
**Table 105-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
105	Chesapeake Blvd	Pump 3	Pump	3	3	Vibrating Cavitating	Continue Scheduled Maintenance Activities	Slight vibration at the top of the pump. Pump and shaft made noise	2
105	Chesapeake Blvd	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation. Check valves had slight audible slam on closure.	1
105	Chesapeake Blvd	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Check Valve Pump 3	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
105	Chesapeake Blvd	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

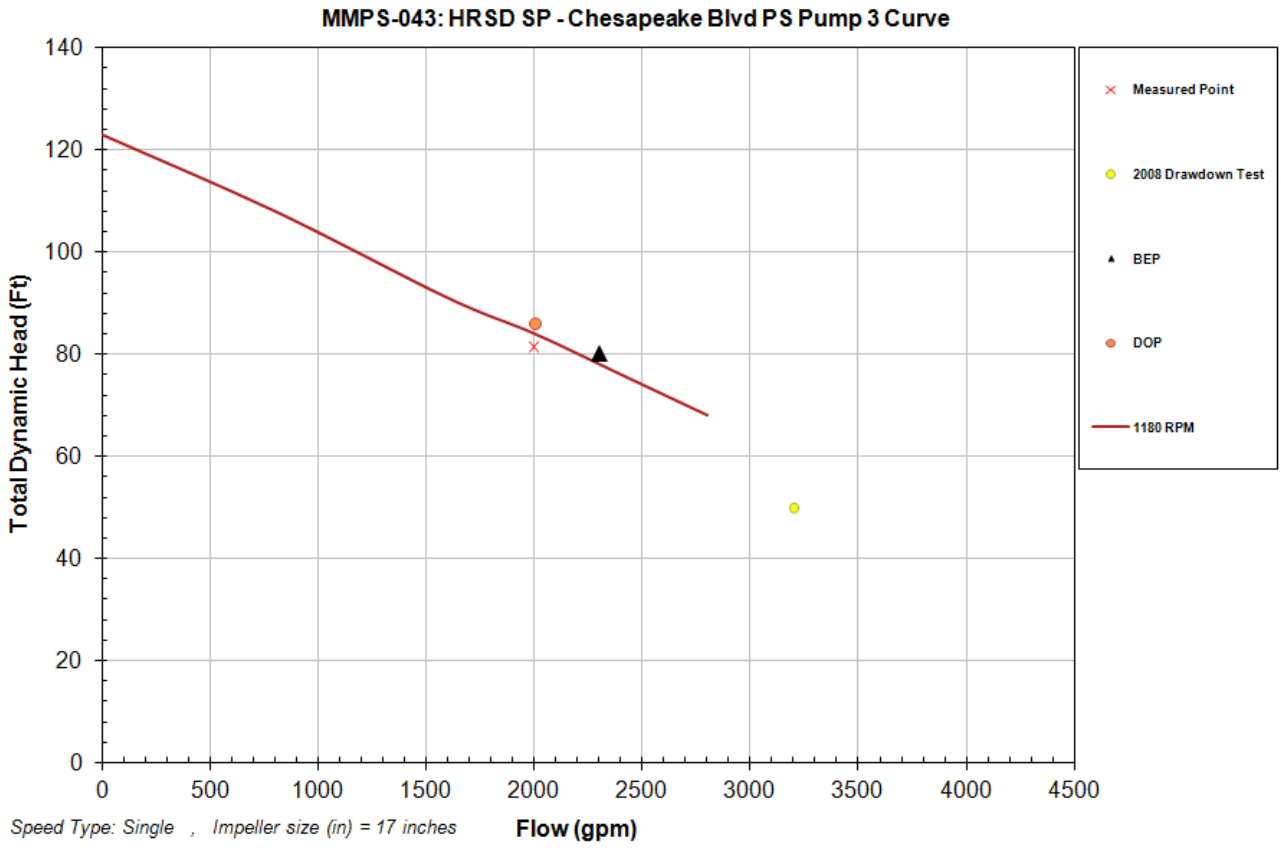
Table 105-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
105	Chesapeake Blvd	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Instrumentation System	Instrumentation System	3	2	Good	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/ control	2
105	Chesapeake Blvd	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed	Continue Scheduled Maintenance Activities		2
105	Chesapeake Blvd	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	MMPS	MMPS	1	1	No panel door grounding wire is installed.	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	SCADA	SCADA	2	1	No panel door grounding wire. Uncapped wires are present in the pull box. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Engine	Generator Drive Engine	3	1	Leaking Fluids	Continue Scheduled Maintenance Activities	Equipment runs well, has minor leaks.	2
105	Chesapeake Blvd	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
105	Chesapeake Blvd	Tank 2	Fuel Tank	1	1	Good	No Immediate Action Required	Transcube.	1

### Draw-Down Testing







### Chesapeake Blvd Assets of Interest

The Chesapeake Blvd pumps were experiencing maintenance issues at the time of inspection.



Figure 105-3. Chesapeake Blvd Pump No.1

#### Chesapeake Blvd Lightning Protection Field Observations:

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel is not bonded to the station grounding system

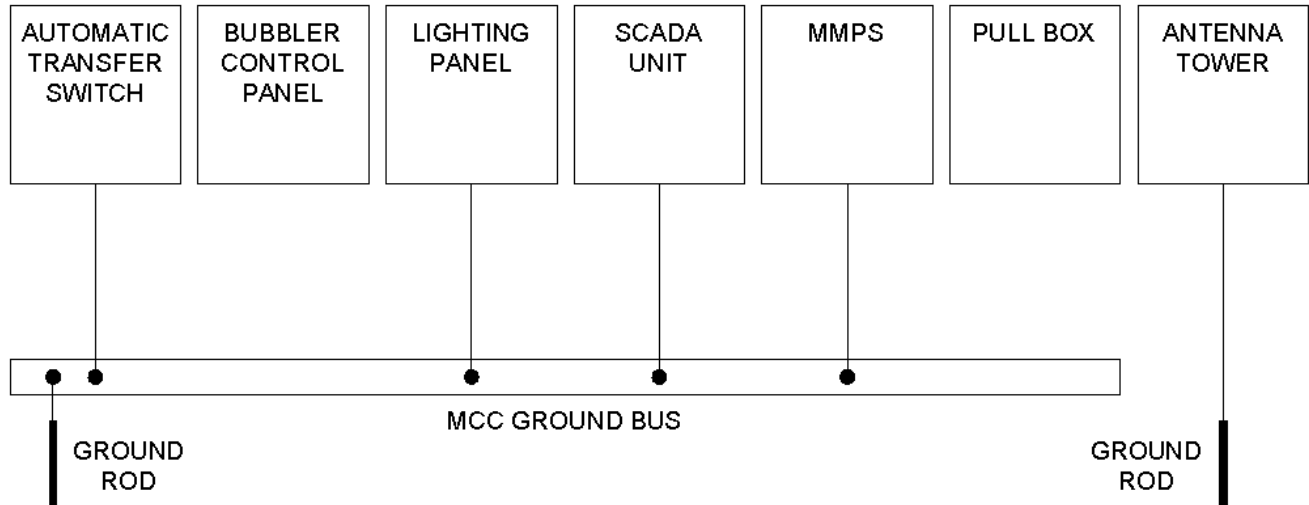


Figure 105-4. Chesapeake Blvd Grounding System

### Chesapeake Blvd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion

- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 106 City Park Pump Station

### City Park Facility Description



Figure 106-1. City Park Pump Station Location Map



Figure 106-2. City Park Pump Station

<b>Table 106-1. City Park PS</b>	
Pumping Facility Number	106
Date of Initial Inspection	6/23/2008
Date of Update Inspection	6/23/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/8/2011
Date of Construction	1948
Address	Ft of La Vallette Avenue, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	28 ft.
Firm Pumping Capacity (GPM)	960 GPM
Total Pumping Capacity (GPM)	1920 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	960 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M
Motor Manufacturer	General Electric
Motor Nameplate Power (HP)	10
Generator Power (KW)	None

### City Park Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 106-2. Pumping Facility Asset Condition and Performance Ratings

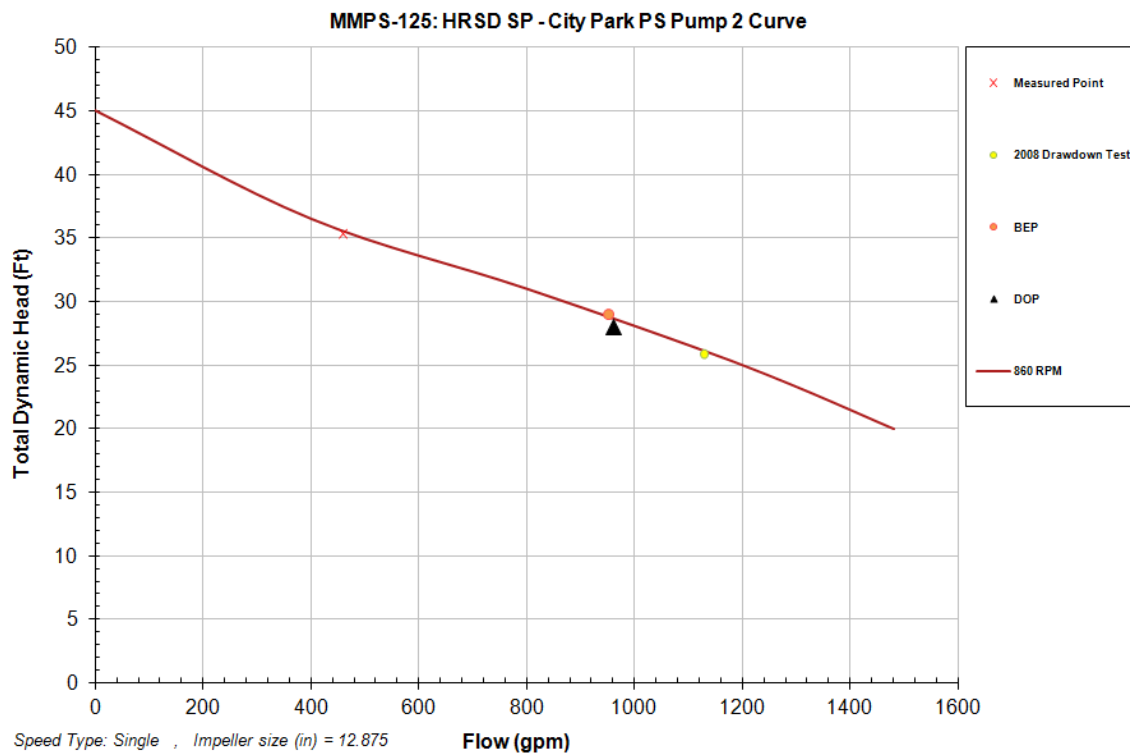
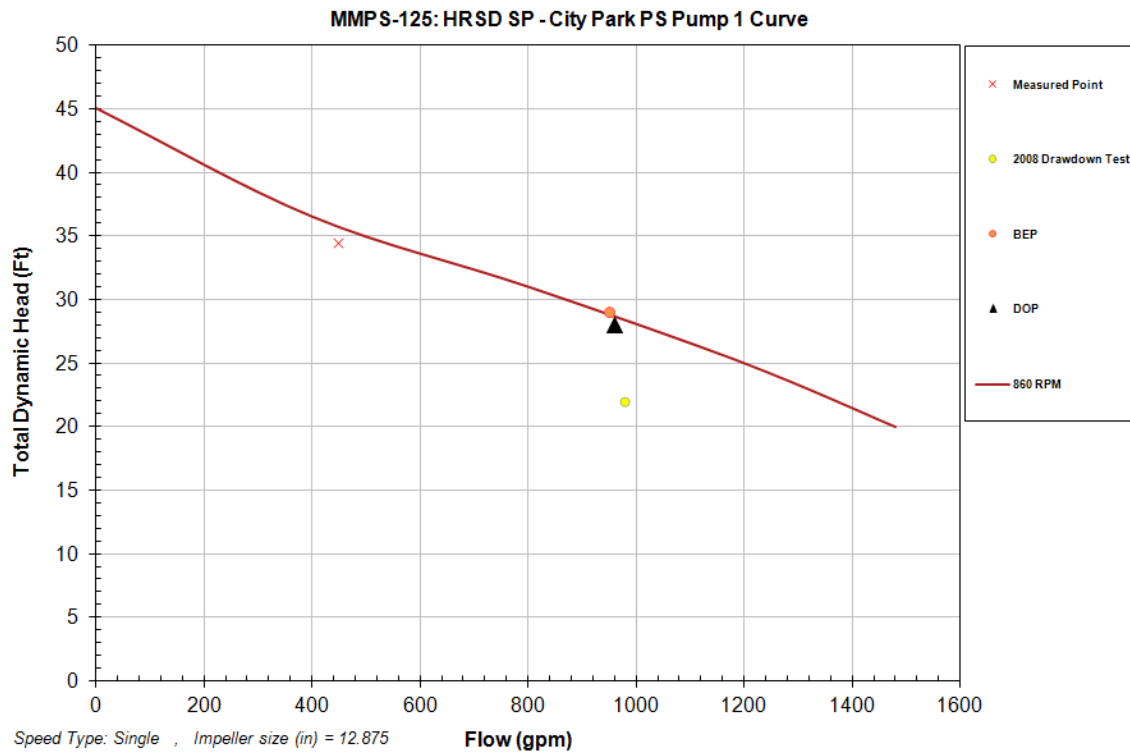
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
106	City Park	Building	Building	2	1	Good	No Immediate Action Required	There is a temporary above ground force main behind the building. Godwin D62110 onsite 2400 lb crane Slate roof	1
106	City Park	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Passive ventilation only in motor room. Dry well ventilation is weak.	1
106	City Park	Wet well	Wet well	2	1	Good	No Immediate Action Required	5/2012: HRSD PM inspection on 02/01/2012 indicates no major changes from the 2008 wet well data.	1
106	City Park	Influent Valve	Influent Valve	3	1	None to Report	Continue Scheduled Maintenance Activities	No Comment	2
106	City Park	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
106	City Park	Motor 2	Wastewater Pump Motor and Controller	2	1	Good Opposite End Bearing Noise	No Immediate Action Required	Lead on day of inspection. Bearing noise was faint.	1
106	City Park	Pump 1	Pump	3	1	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Slapping like noise in pump shaft on startup. From nameplate: 500 gpm @ 30' TDH Slight vibration in upper portion of pump - likely from shaft. Flow meter: 725 gpm, 7.6 fps Static pressure: 7.2 psi, pumping pressure: 9.7 psi.	2
106	City Park	Pump 2	Pump	3	1	Shaft Deflection	Continue Scheduled Maintenance Activities	Slapping like noise in pump shaft on startup. FROM NAMEPLATE: 500gpm @ 30' TDH. Flow meter: 720 gpm, 7.5 fps.	2
106	City Park	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
106	City Park	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
106	City Park	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 106-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
106	City Park	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
106	City Park	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
106	City Park	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
106	City Park	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
106	City Park	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
106	City Park	Electrical Equipment	Electrical Equipment	3	2	Good Panel Corroded	Continue Scheduled Maintenance Activities	No automatic back up power source. Utility panels outside appear to have been hit by a vehicle.	2
106	City Park	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control. Excess flow meter wiring is not being properly stored.	2
106	City Park	Bubbler Panel	Bubbler Panel	3	2	Uncapped wires are loose in the panel. No panel door grounding wire is installed. Corrosion is present in the bottom of the panel.	Continue Scheduled Maintenance Activities	No Comment	2
106	City Park	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
106	City Park	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
106	City Park	SCADA	SCADA	3	1	No panel door grounding wire. Terminal strip not labeled. Corrosion is present on the outside of each panel & is affecting the panel door operation.	Continue Scheduled Maintenance Activities	No Comment	2
106	City Park	Transfer Switch	Transfer Switch	2	1	No panel door grounding wire. Corrosion forming on the outside of the panel.	No Immediate Action Required	No Comment	1



### Draw-Down Testing



### City Park Assets of Interest

The station pumps were experiencing maintenance issues at the time of inspection.



Figure 106-3. City Park Pump Room

### City Park Lightning Protection Field Observations:

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & SCADA Unit are not bonded to the station grounding system

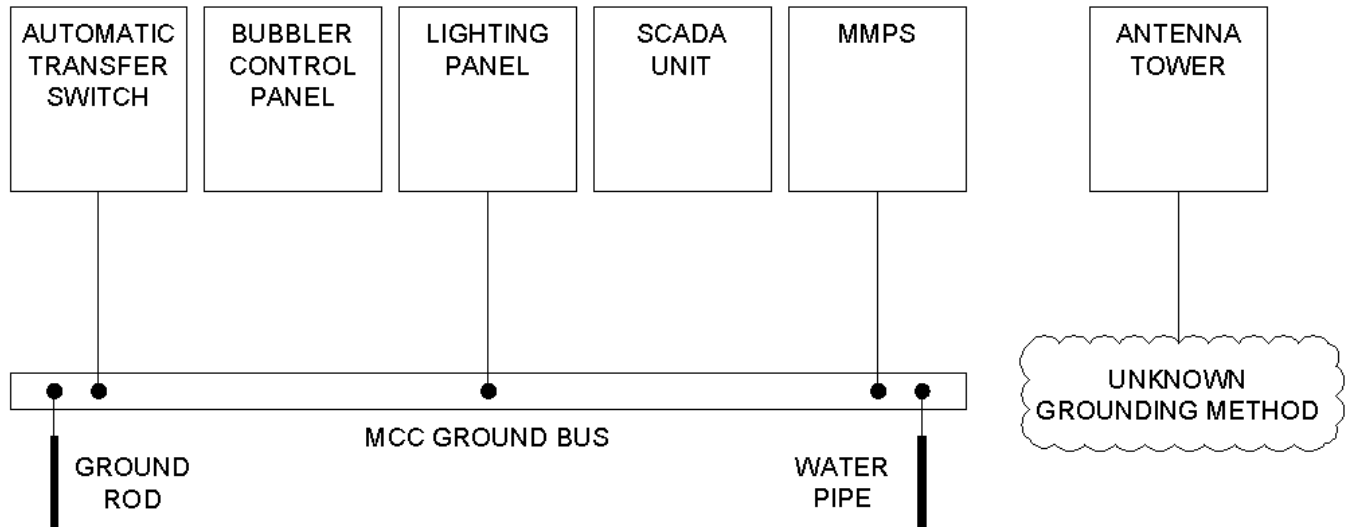


Figure 106-4. City Park Grounding System

### City Park Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion

- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 107 Colley Ave Pump Station

### Colley Ave Facility Description

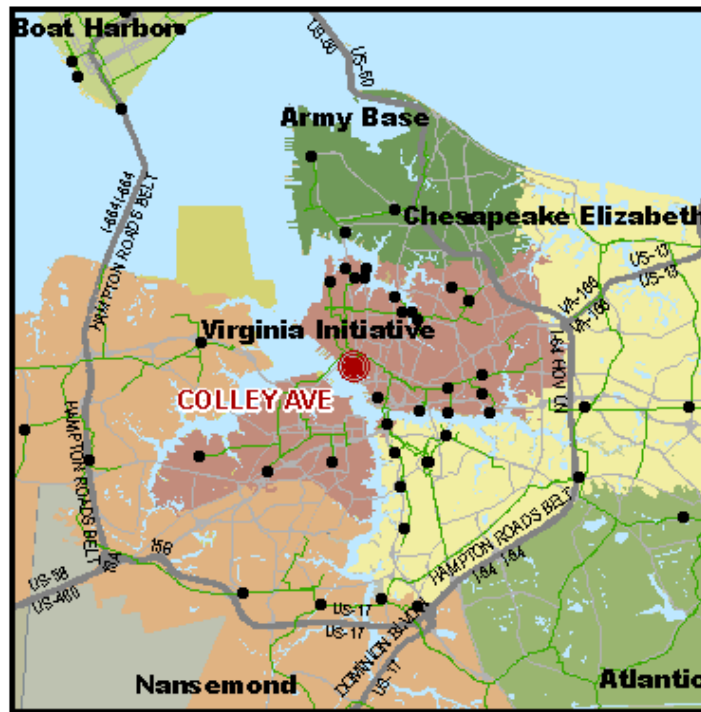


Figure 107-1. Colley Ave Pump Station Location Map



Figure 107-2. Colley Ave Pump Station

<b>Table 107-1. Colley Ave PS</b>	
Pumping Facility Number	107
Date of Initial Inspection	6/19/2008
Date of Update Inspection	6/21/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	6/23/2011
Date of Construction	1969
Address	715 Fairfax Avenue, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	30 ft.
Firm Pumping Capacity (GPM)	8100 GPM
Total Pumping Capacity (GPM)	13500 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Alliss Chalmers
Pump Nameplate Capacity	2700 GPM, 5400 GPM, 5400 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M
Motor Manufacturer	Alliss Chalmers
Motor Nameplate Power (HP)	25, 25, 50
Generator Power (KW)	100

\*30 ft. is below the CD150M normal operating range.

### Colley Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 107-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
107	Colley Avenue	Building	Building	2	1	Good	No Immediate Action Required	Godwin pump onsite (D62451) with flow meter installed on piping. 1000lb crane rail.	1
107	Colley Avenue	HVAC System	HVAC System	3	3	Fans Vibrate	Continue Scheduled Maintenance Activities	Wet well fan made noise. Duct work repaired with gasket material and hose clamps.	2
107	Colley Avenue	Wet well	Wet well	3	2	None	Continue Scheduled Maintenance Activities	6/23/2009-HRSD installed new stairway. 6/2012: HRSD PM inspection on 03/05/2012 indicates visible degradation of concrete throughout. The aggregate exposure varies greatly depending on position in well.	2
107	Colley Avenue	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
107	Colley Avenue	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
107	Colley Avenue	Motor 2	Wastewater Pump Motor and Controller	3	3	Vibrates Higher than Expected Operating Temperature	Continue Scheduled Maintenance Activities	Vibration and higher than expected temperature.	2
107	Colley Avenue	Motor 3	Wastewater Pump Motor and Controller	3	1	Shaft Bearing Noise	Continue Scheduled Maintenance Activities	Motor made noise.	2
107	Colley Avenue	Pump 1	Pump	3	3	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Size is 12x12x15. 2700 gpm. Impeller diameter = 13 1/4" and 25' TDH. Test conditions: 1750 gpm, 4.9 fps. There is no splash guard. The pump made noise. Shaft deflection appeared to be causing vibration	2
107	Colley Avenue	Pump 2	Pump	3	3	Vibrating Cavitating	Continue Scheduled Maintenance Activities	Shaft bearing felt warm. Test conditions: 3200 gpm, 3.9 fps.	2

**Table 107-2. Pumping Facility Asset Condition and Performance Ratings**

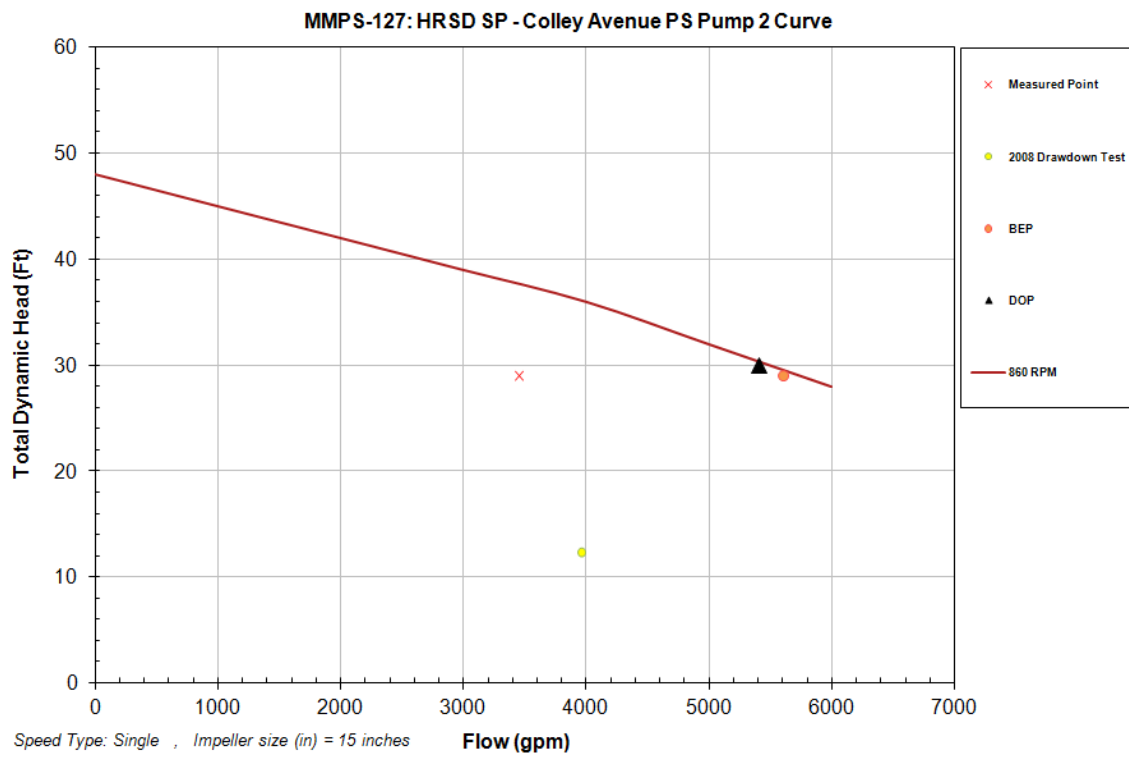
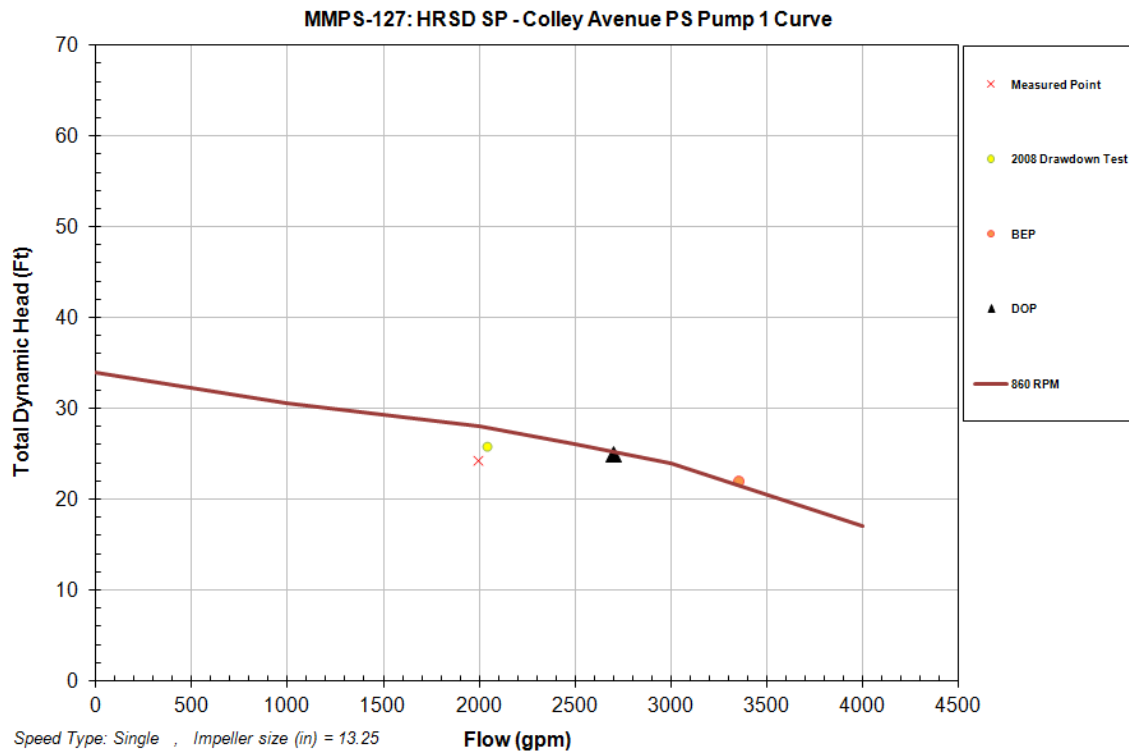
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
107	Colley Avenue	Pump 3	Pump	3	2	Vibrating	Continue Scheduled Maintenance Activities	12X12X15, 25' TDH, Impeller diameter = 13 1/4". Test conditions: 1550 gpm, 4.3 fps.	2
107	Colley Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
107	Colley Avenue	Valves System	All Station Valves	2	2	None to Report	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation. Check valve leaves slam shut. #1&#3 suction 16", discharge/check 12". #2 suction 20", discharge/check 18"	1
107	Colley Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
107	Colley Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
107	Colley Avenue	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
107	Colley Avenue	Check Valve Pump 1	Check Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
107	Colley Avenue	Check Valve Pump 2	Check Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
107	Colley Avenue	Check Valve Pump 3	Check Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
107	Colley Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
107	Colley Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
107	Colley Avenue	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

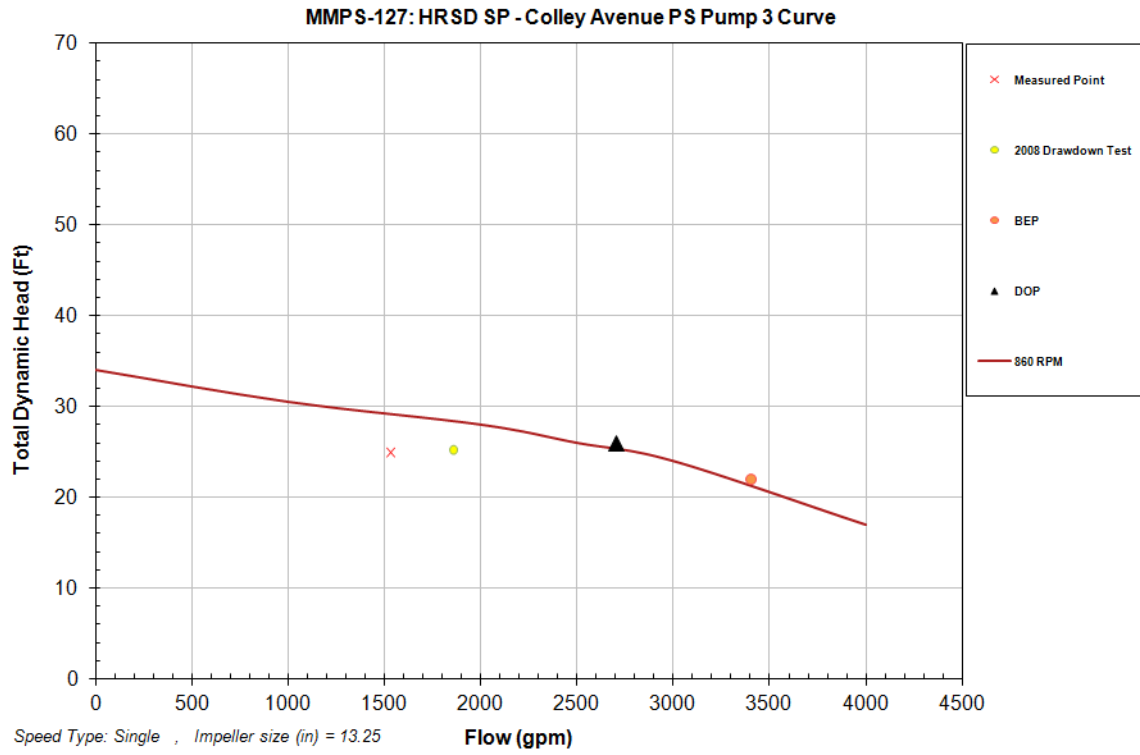


Table 107-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
107	Colley Avenue	Electrical Equipment	Electrical Equipment	3	2	Panel Corroded Dust Inside Panel	Continue Scheduled Maintenance Activities	Lighting panel has a hole through the top.	2
107	Colley Avenue	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
107	Colley Avenue	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed	Continue Scheduled Maintenance Activities	No Comment	2
107	Colley Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
107	Colley Avenue	MMPS	MMPS	2	1	None to Report	No Immediate Action Required	No Comment	1
107	Colley Avenue	SCADA	SCADA	2	1	No panel door grounding wire Terminal strip not labeled	No Immediate Action Required	No Comment	1
107	Colley Avenue	Transfer Switch	Transfer Switch	2	1	No panel door grounding wire.	No Immediate Action Required	Hole in the bottom of the panel.	1
107	Colley Avenue	Engine	Generator Drive Engine	2	1	Good Poor Accessibility	No Immediate Action Required	Radiator does not have shroud to exhaust warm air.	1
107	Colley Avenue	Generator	Generator	2	1	Good Poor Accessibility	No Immediate Action Required	No Comment	1
107	Colley Avenue	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
107	Colley Avenue	Tank	Fuel Tank	1	1	Good	No Immediate Action Required	Transcube used instead of belly tank.	1

### Draw-Down Testing





### Colley Ave Assets of Interest

Motor No. 2 gets warm in operation. There is a fan on a pedestal providing cooling air.



Figure 107-3. Motor No. 2 Cooling Fan

### Colley Ave Lightning Protection Field Observations:

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & SCADA Unit are not bonded to the station grounding system

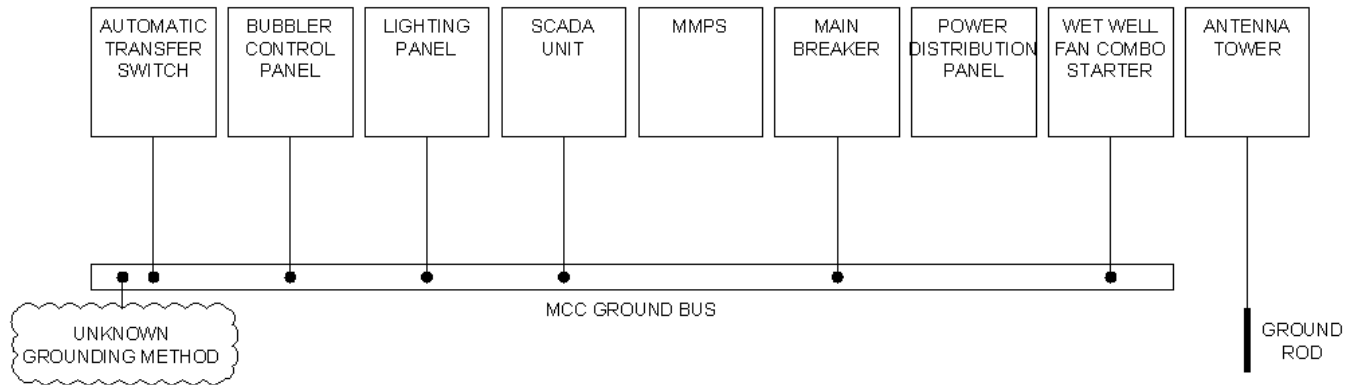


Figure 107-6. Colley Ave Grounding System

### Colley Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 108 Dovercourt Rd Pump Station

### Dovercourt Rd Facility Description

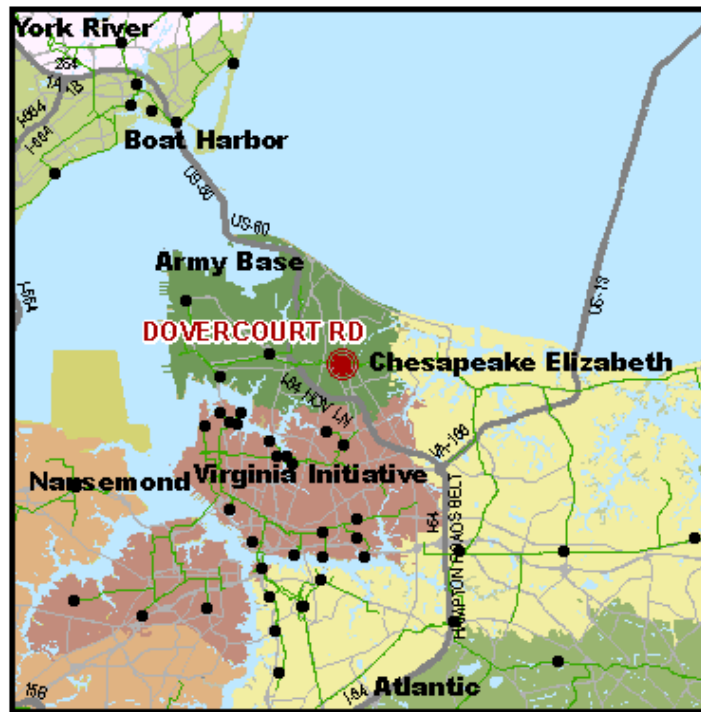


Figure 108-1. Dovercourt Rd Pump Station Location Map



Figure 108-2. Dovercourt Rd Pump Station

<b>Table 108-1. Dovercourt Rd PS</b>	
Pumping Facility Number	108
Date of Initial Inspection	6/19/2008
Date of Update Inspection	6/22/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/19/2011
Date of Construction	1961
Address	948 Dovercourt Road, Norfolk
Receiving Facility	Army Base Treatment Plant
Design Head (Feet)	100
Firm Pumping Capacity (GPM)	11300 GPM
Total Pumping Capacity (GPM)	17800 GPM
Number of Pumps	4
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse (2), Allis Chalmers (2)
Pump Nameplate Capacity	2000, 2800, 6500, 6500
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse (1), Marathon Electric (3)
Motor Nameplate Power (HP)	100, 100, 150, 150
Generator Power (KW)	None

### Dovercourt Rd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



Table 108-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
108	Dovercourt Road	Building	Building	2	1	Good	No Immediate Action Required	Slight weep at #4 suction side wall penetration. Broken Gutter Weep at discharge wall penetration. 1.5 ton crane rail	1
108	Dovercourt Road	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Ozone for odor control. No wet well fan- being sized for replacement. Crews bring fan to site.	1
108	Dovercourt Road	Wet well	Wet well	4	1	None	Schedule Corrective Action	Floor on intermediate deck has visible aggregate exposure. 5/2012: HRSD PM inspection on 02/21/2012 indicates no major changes from the 2008 wet well data.	3
108	Dovercourt Road	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
108	Dovercourt Road	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
108	Dovercourt Road	Motor 2	Wastewater Pump Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Not enough vibration to affect overall rating at this time. Lead on day of visit - 45%-75% RPM in normal operations.	1
108	Dovercourt Road	Motor 3	Wastewater Pump Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Not enough vibration to affect overall rating at this time.	1
108	Dovercourt Road	Motor 4	Wastewater Pump Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Not enough vibration to affect overall rating at this time.	1
108	Dovercourt Road	Pump 1	Pump	3	2	Bearing Noise	Continue Scheduled Maintenance Activities	Rpm is 1150. Unable to verify impeller diameter.	2
108	Dovercourt Road	Pump 2	Pump	3	2	None to Report	Continue Scheduled Maintenance Activities	Rpm is 1150. Unable to verify impeller diameter. Stuffing box was overflowing before Ops cleaned drain line.	2
108	Dovercourt Road	Pump 3	Pump	3	2	Cavitating	Continue Scheduled Maintenance Activities	Pump made noise.	2

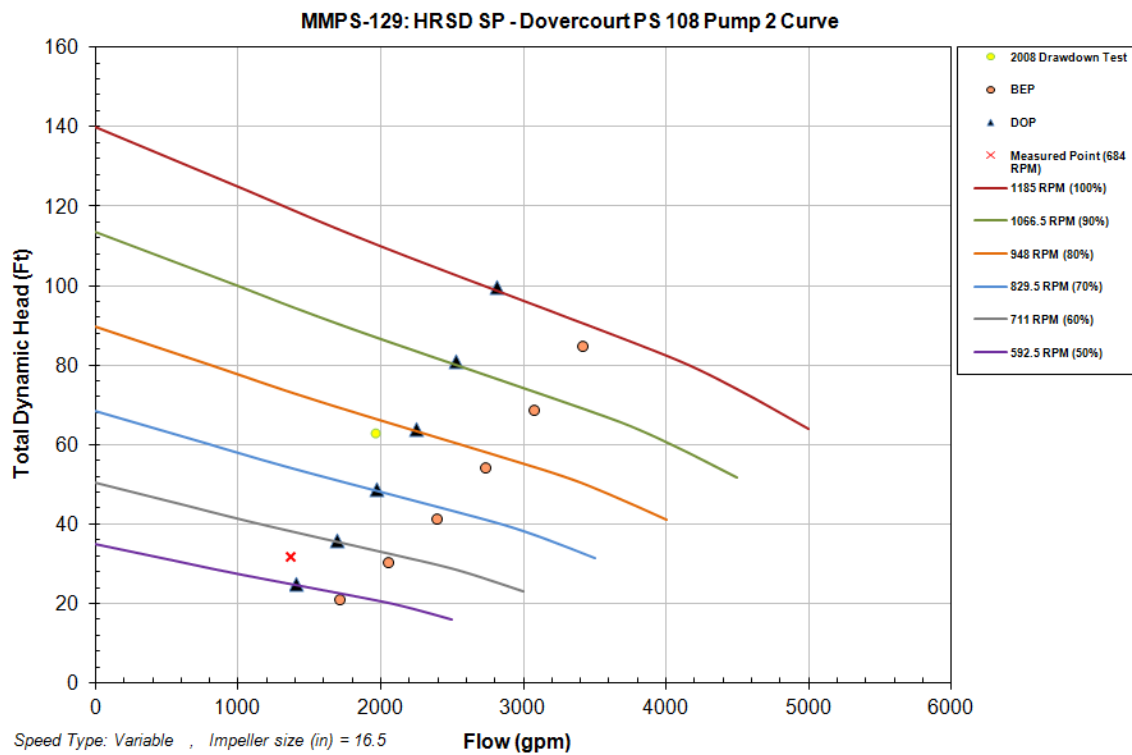
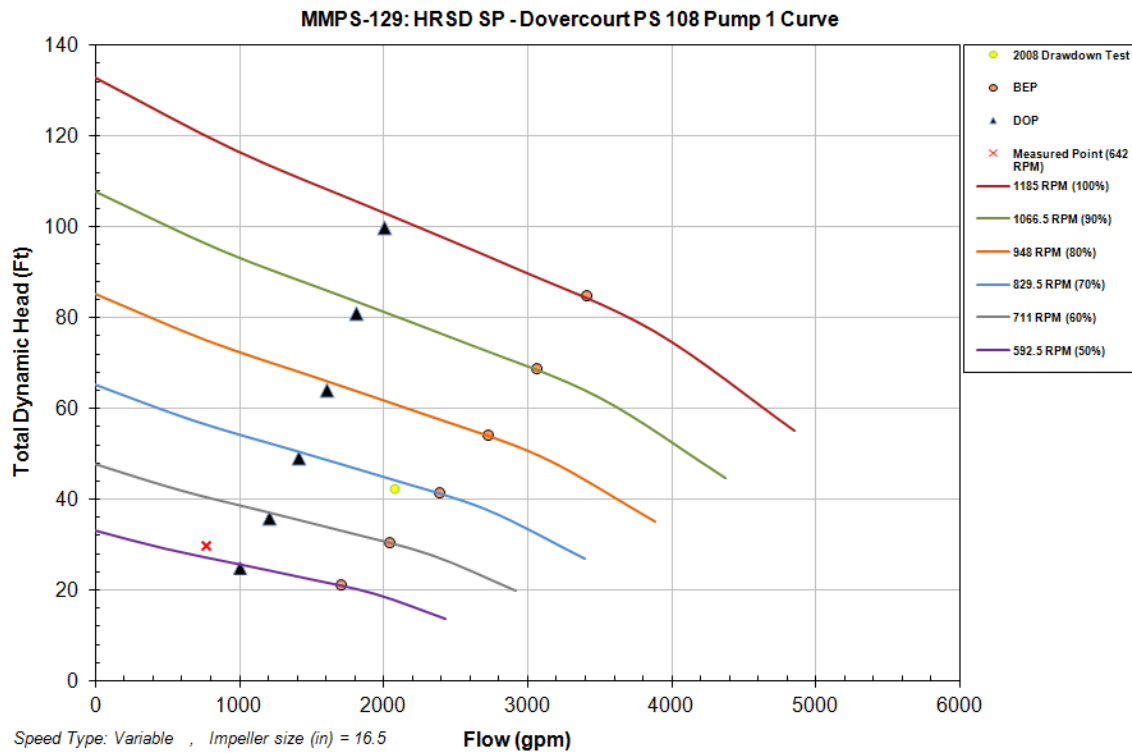
**Table 108-2. Pumping Facility Asset Condition and Performance Ratings**

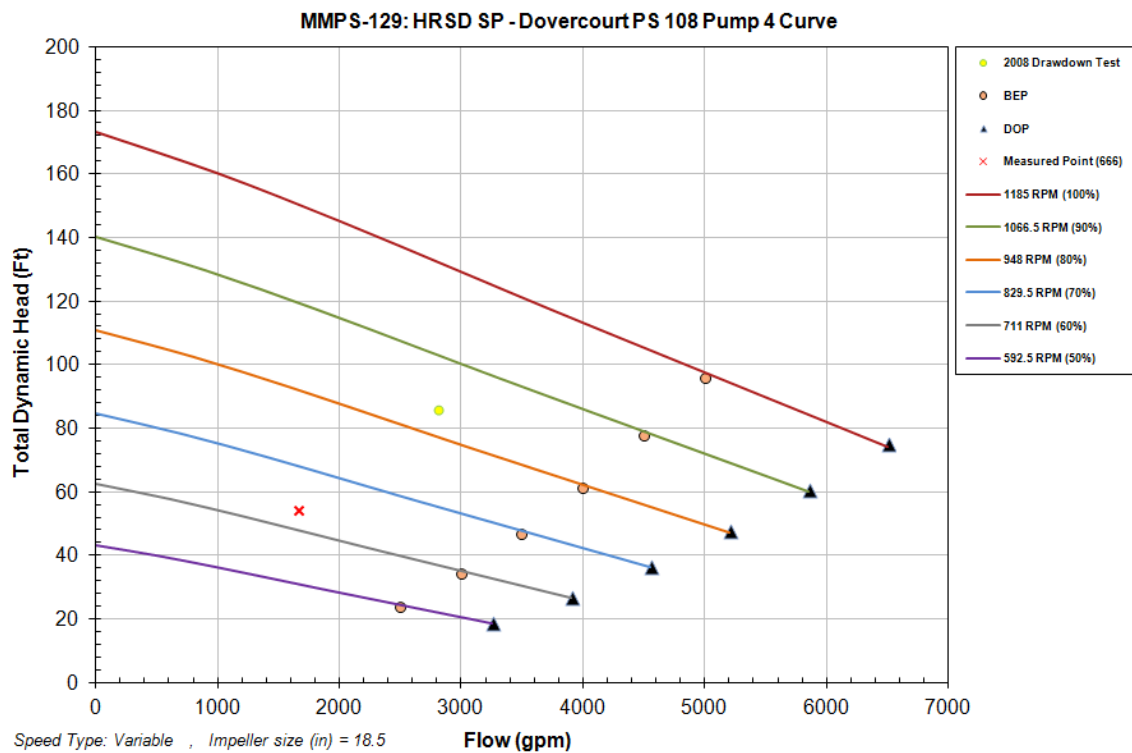
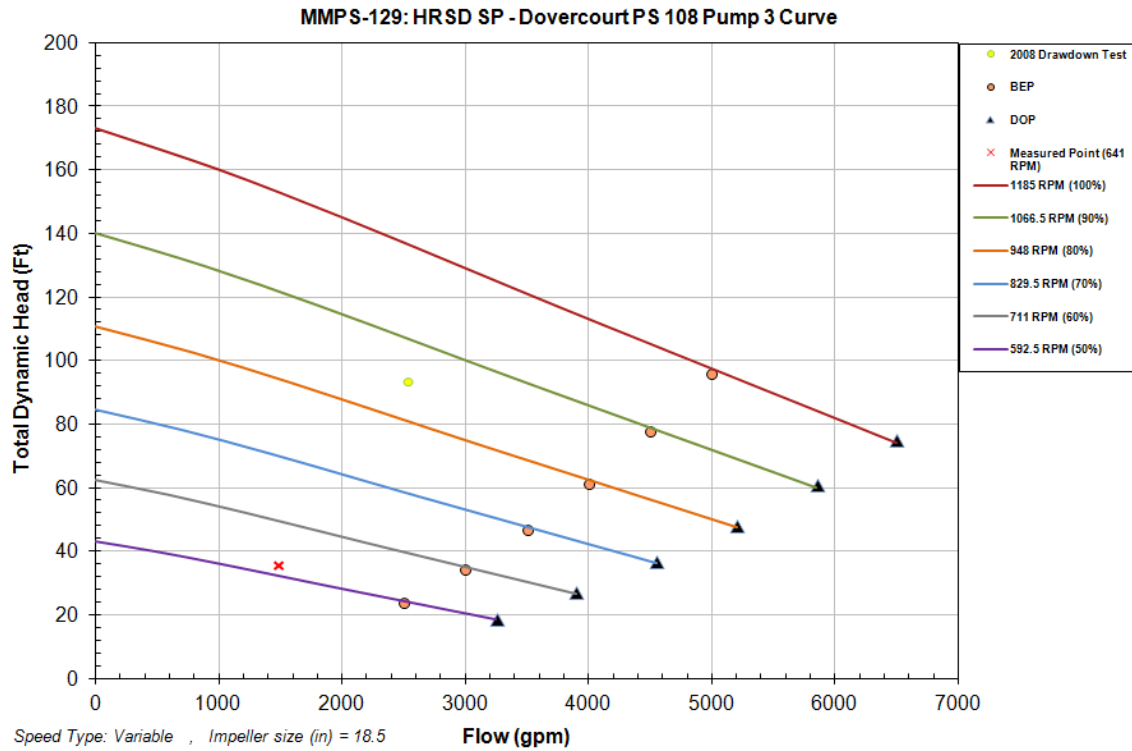
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
108	Dovercourt Road	Pump 4	Pump	3	3	Vibrating Shaft Deflection Cavitating	Continue Scheduled Maintenance Activities	Impeller diameter was 18.5. Gpm = 4000. Rpm = 840. Impeller size may have been modified. Shaft made noise. Leaks around the base of volute.	2
108	Dovercourt Road	Pump 5	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
108	Dovercourt Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	All pump #1 and #2 valves are 12". All pump #3 and #4 valves are 16". Pump #3 and #4 check valves had a slight audible slam on closure. Discharge #2 is dripping. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
108	Dovercourt Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Check Valve Pump 3	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Check Valve Pump 4	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 108-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
108	Dovercourt Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
108	Dovercourt Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
108	Dovercourt Road	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No automatic back up power source.	1
108	Dovercourt Road	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	Fluidtron analog gauge/control	1
108	Dovercourt Road	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed. Uncapped wires in the panel.	No Immediate Action Required	No Comment	1
108	Dovercourt Road	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
108	Dovercourt Road	Compressor	Compressor	1	1	None to Report	No Immediate Action Required	No Comment	1
108	Dovercourt Road	MMPS	MMPS	2	1	None to Report	No Immediate Action Required	.	1
108	Dovercourt Road	SCADA	SCADA	2	1	No panel door grounding wire Terminal strip not labeled Uncapped wires in the panel	No Immediate Action Required	No Comment	1
108	Dovercourt Road	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
108	Dovercourt Road	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Unable to shutdown power and open panel	1

### Draw-Down Testing





### Dovercourt Rd Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Dovercourt Rd wet well is deteriorating.



Figure 108-3. Dovercourt Wet Well Intermediate Slab

### Dovercourt Rd Lightning Protection Field Observations:

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel & velocity profiler are not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system

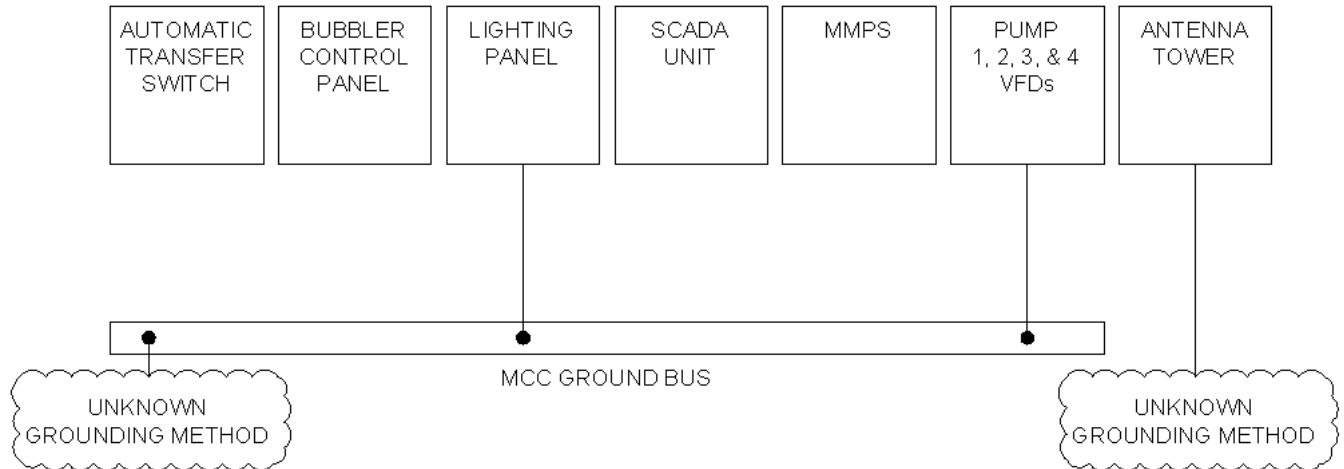


Figure 108-4. Dovercourt Rd Grounding System

### Dovercourt Rd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

- Alternate power feed instead of standby generator

### **Dovercourt Rd Dual Power Feed Assessment**

Information obtained from the local electrical utility indicates that this station has redundant transformers each with a different circuit feeding it from the utility. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.



## PS 109 Dozier's Corner Pump Station

### Dozier's Corner Facility Description

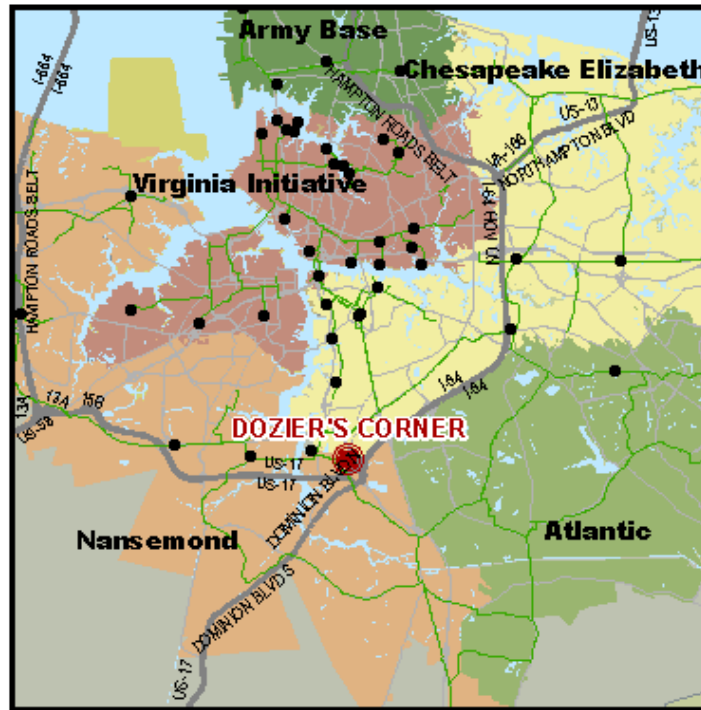


Figure 109-1. Dozier's Corner Pump Station Location Map



Figure 109-2. Dozier's Corner Pump Station

<b>Table 109-1. Dozier's Corner PS</b>	
Pumping Facility Number	109
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/9/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/8/2011
Date of Construction	1962
Address	1121 Keats Street, Norfolk
Receiving Facility	Atlantic Treatment Plant
Design Head (Feet)	19
Firm Pumping Capacity (GPM)	625 GPM
Total Pumping Capacity (GPM)	1300 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	625 GPM, 675 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	5
Generator Power (KW)	None

### Dozier's Corner Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

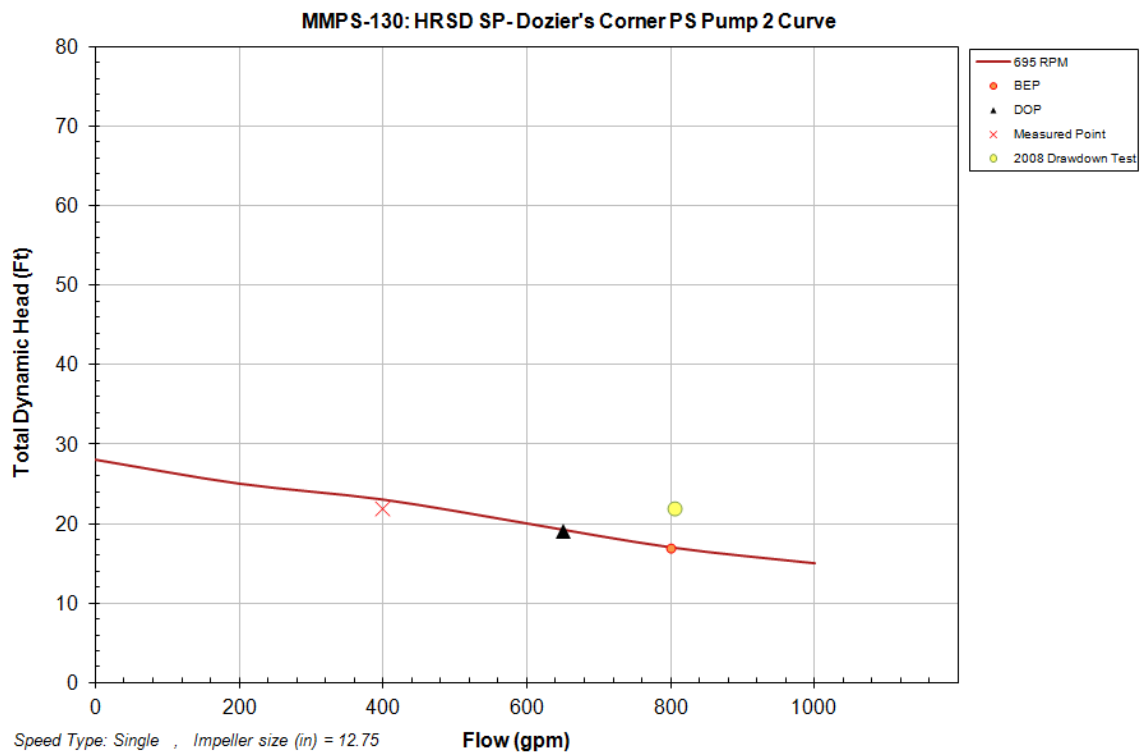
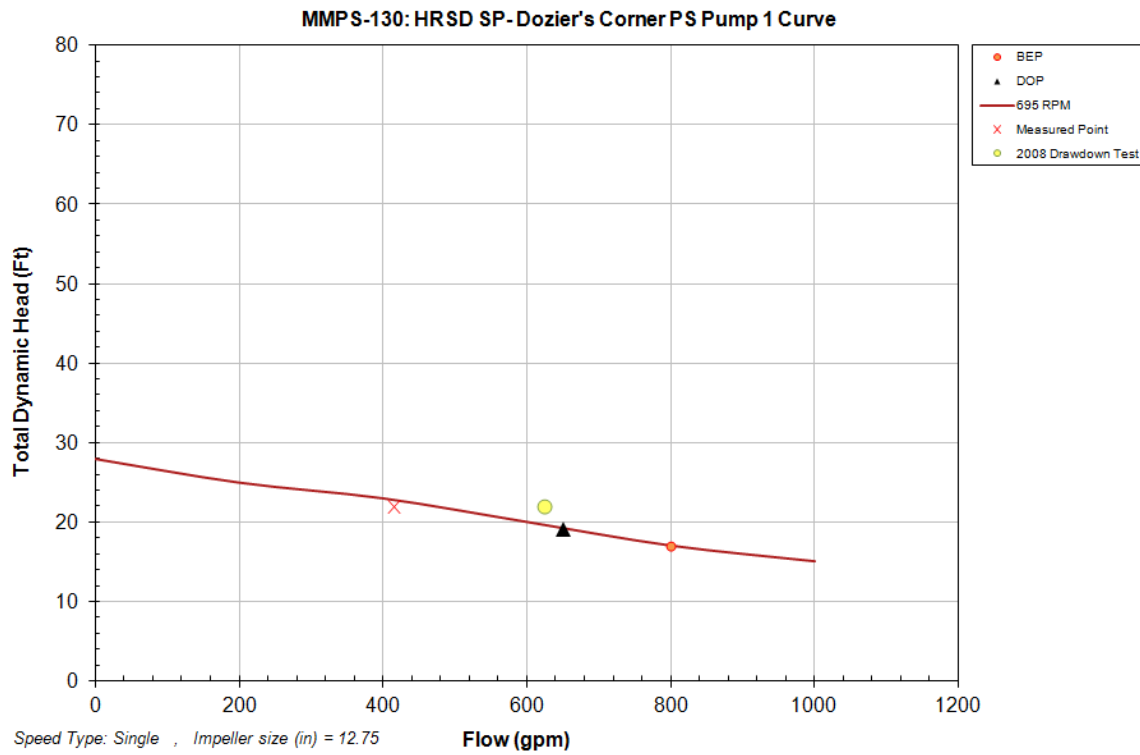
Table 109-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
109	Dozier's Corner	Building	Building	2	1	Good	No Immediate Action Required	Rehab/improvement measures to prevent flooding including coffer dam.	1
109	Dozier's Corner	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	0.76 HP HVAC blower	1
109	Dozier's Corner	Wet well	Wet well	2	1	Good	No Immediate Action Required	Rehab deck and walls in intermediate area. 5/2012: HRSD PM inspection on 03/06/2012 indicates no major changes from the 2008 wet well data.	1
109	Dozier's Corner	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
109	Dozier's Corner	Motor 1	Wastewater Pump Motor and Controller	3	1	Higher than Expected Operating Temperature	Continue Scheduled Maintenance Activities	Higher than expected operating temperature	2
109	Dozier's Corner	Motor 2	Wastewater Pump Motor and Controller	3	1	None to Report	Continue Scheduled Maintenance Activities	None	2
109	Dozier's Corner	Pump 1	Pump	3	1	None to Report	Continue Scheduled Maintenance Activities	Slight slapping noise on startup.	2
109	Dozier's Corner	Pump 2	Pump	3	1	None to Report	Continue Scheduled Maintenance Activities	Nameplate missing. Slight slapping noise on startup.	2
109	Dozier's Corner	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	2 sumps, bi-level	1
109	Dozier's Corner	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
109	Dozier's Corner	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
109	Dozier's Corner	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
109	Dozier's Corner	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
109	Dozier's Corner	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 109-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
109	Dozier's Corner	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
109	Dozier's Corner	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
109	Dozier's Corner	Electrical Equipment	Electrical Equipment	2	1	Good Cables Fatigued and Cracked Dust Inside Panel	No Immediate Action Required	No automatic back up power source.	1
109	Dozier's Corner	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
109	Dozier's Corner	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed	Continue Scheduled Maintenance Activities	No Comment	2
109	Dozier's Corner	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
109	Dozier's Corner	MMPS	MMPS	2	1	None to Report	No Immediate Action Required	No Comment	1
109	Dozier's Corner	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
109	Dozier's Corner	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No panel door grounding wire is installed.	1

## Draw-Down Testing



Dozier's Corner PS does not have a discharge pressure sensor with remote indication. The station does not discharge to a manifolded force main so the TDH was assumed based on the results of the 2008 draw down test. The Flow is the average pumping rate.

**Dozier's Corner Assets of Interest**

None.

**Dozier's Court Lightning Protection Field Observations:**

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Motor starters & MMPS are not bonded to the station grounding system

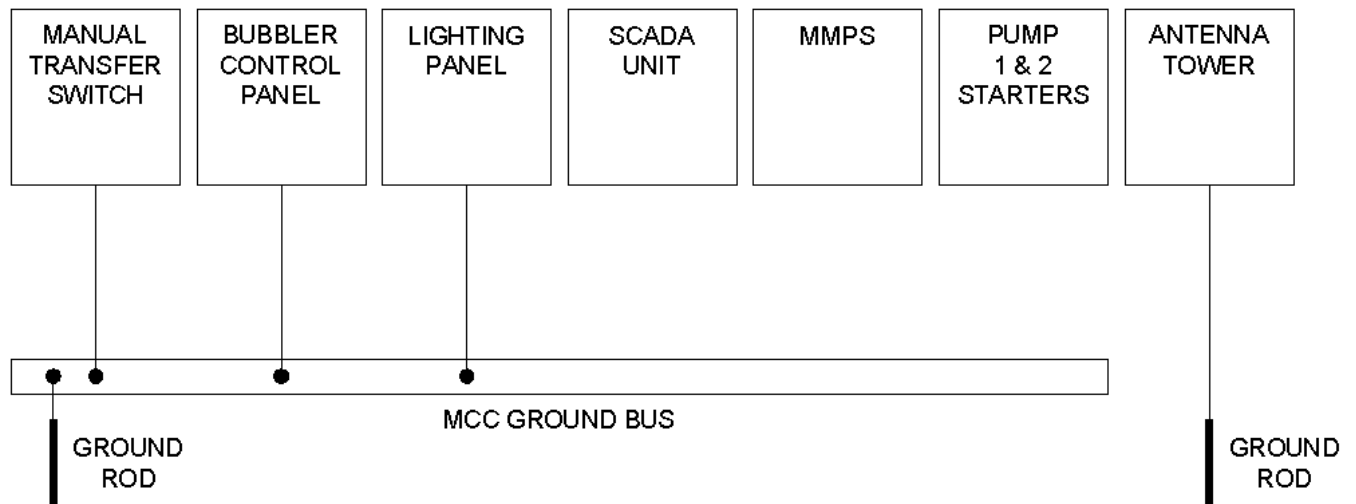


Figure 109-3. Dozier's Court Grounding System

**Dozier's Court Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn

- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - No automatic back up power source

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## PS 110 Ferebee Ave Pump Station

### Ferebee Ave Facility Description

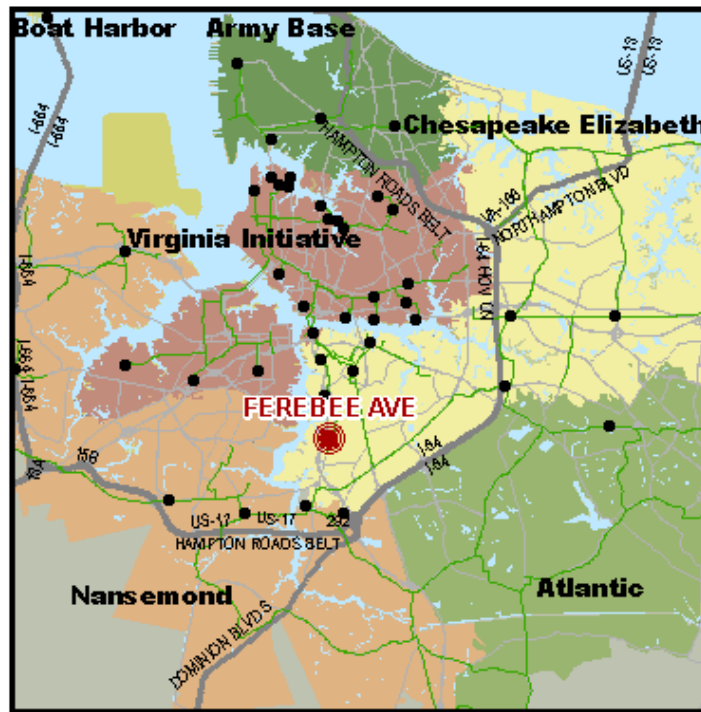


Figure 110-1. Ferebee Ave Pump Station Location Map



Figure 110-2. Ferebee Ave Pump Station

<b>Table 110-1. Ferebee Ave PS</b>	
Pumping Facility Number	110
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/10/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/8/2011
Date of Construction	1951
Address	2812 Bainbridge Blvd, Chesapeake
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	30 ft., 21 ft.
Firm Pumping Capacity (GPM)	600 GPM
Total Pumping Capacity (GPM)	2400 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse (2), Chicago Pump Co. (1)
Pump Nameplate Capacity	300, 300, 1800
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse (2), General Electric (1)
Motor Nameplate Power (HP)	5, 5, 20
Generator Power (KW)	47

### Ferebee Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 110-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
110	Ferebee Avenue	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
110	Ferebee Avenue	HVAC System	HVAC System	2	2	Low Detectable Airflow	No Immediate Action Required	1/6 HP HVAC blower (building/dry well). Wet well ventilation is passive. CMMS showed wet well fan entry, no fan existed during the inspection. It was difficult to detect airflow at the dry well diffuser. There is a boarded up window at the front of the station - on order.	1
110	Ferebee Avenue	Wet well	Wet well	5	4	Hatch Damaged or Difficult to open Concrete Spalling Concrete Corrosion	Replace/Refurbish	Wire mesh showing on wet well walls. Hatch frame rusted and pulling away from slab. 5/2012: HRSD PM inspection on 02/22/2012 indicates no major changes from the 2008 wet well data.	5
110	Ferebee Avenue	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Nameplate hard to read so all info not verified. Motor is aging.	1
110	Ferebee Avenue	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Nameplate too old to read. Motor is aging.	1
110	Ferebee Avenue	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Nameplate hard to read so all info not verified. Motor is aging.	1
110	Ferebee Avenue	Pump 1	Pump	3	3	Good Vibrating	Continue Scheduled Maintenance Activities	Nameplate hard to read so all info not verified. Pump made noise. Shaft is scored from past rubbing on slab penetration. The shaft did not appear to be rubbing against penetration during inspection. Shaft makes a chatter noise.	2
110	Ferebee Avenue	Pump 2	Pump	2	2	Good	No Immediate Action Required	Nameplate hard to read so all info not verified. Pump made noise. Shaft is scored from past rubbing on slab penetration. The shaft did not appear to be rubbing against penetration during inspection.	1
110	Ferebee Avenue	Pump 3	Pump	2	2	Good	No Immediate Action Required	Nameplate hard to read so all info not verified. Pump made noise. Shaft is scored from past rubbing on slab penetration. The shaft did not appear to be rubbing against penetration during inspection. Stuffing box dry.	1
110	Ferebee Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
110	Ferebee Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation. Slight audible slam on closure of #2 check valve - Spring is stretched.	1

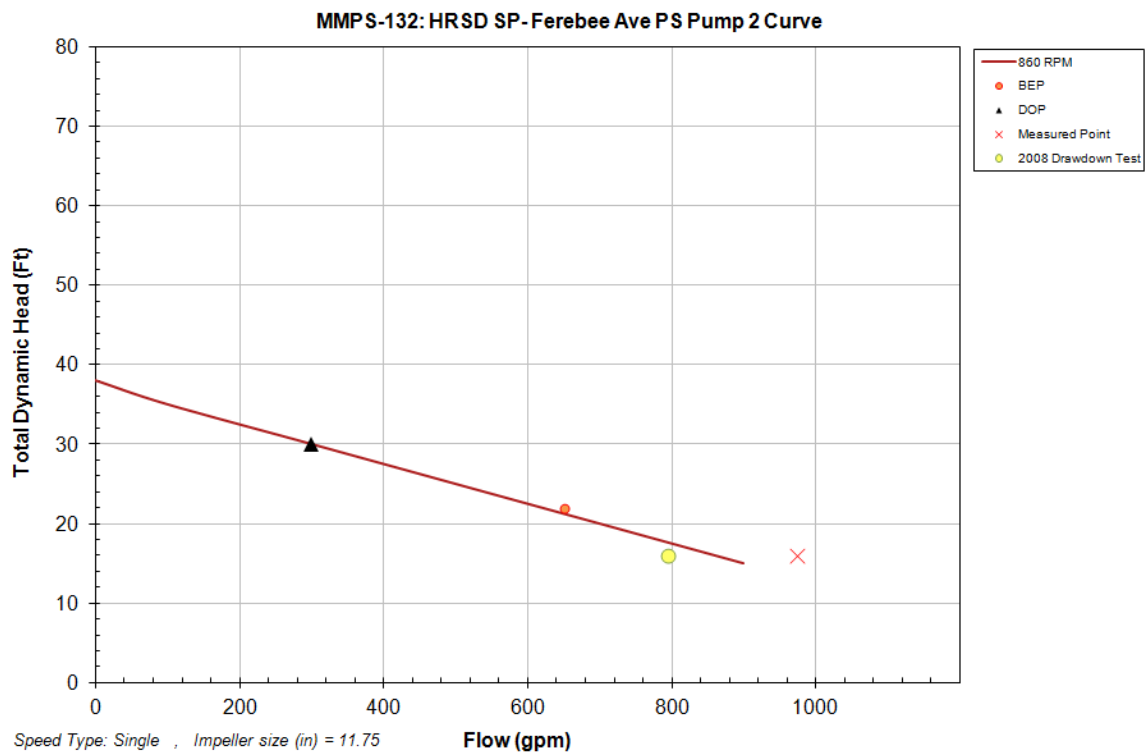
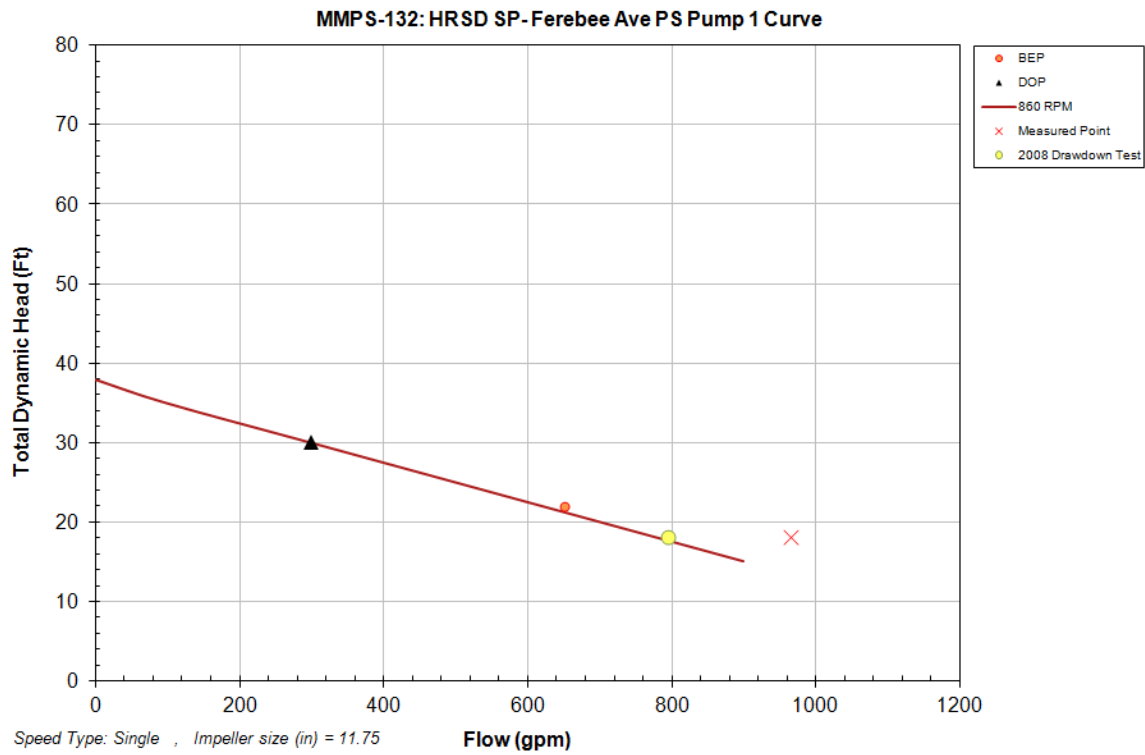
Table 110-2. Pumping Facility Asset Condition and Performance Ratings

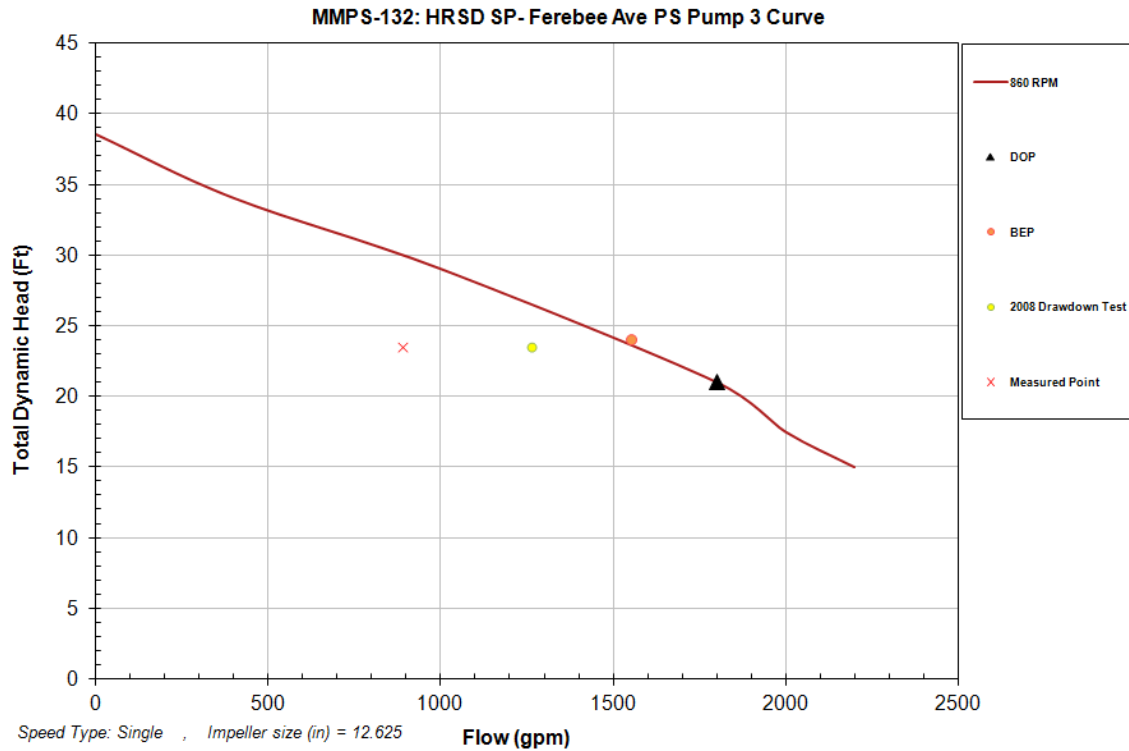
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
110	Ferebee Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
110	Ferebee Avenue	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete Dust Inside Panel	Continue Scheduled Maintenance Activities	No Comment	2
110	Ferebee Avenue	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
110	Ferebee Avenue	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed.	Continue Scheduled Maintenance Activities	Panel is soot covered and wireway is melted on the inside of the panel due to a fire.	2
110	Ferebee Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
110	Ferebee Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

**Table 110-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
110	Ferebee Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
110	Ferebee Avenue	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
110	Ferebee Avenue	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	New engine.	1
110	Ferebee Avenue	Generator	Generator	1	1	Good	No Immediate Action Required	New Kohler generator.	1
110	Ferebee Avenue	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
110	Ferebee Avenue	Tank 1	Fuel Tank	1	1	Good	No Immediate Action Required	New fuel day tank.	1

## Draw-Down Testing





Ferebee PS does not have a discharge pressure sensor with remote indication. The station does not discharge to a manifolded force main so the TDH was assumed based on the results of the 2008 draw down test. The Flow is the average pumping rate. The Pump 3 Measured Point flow was calculated by quantifying changes in wet well stored volume.



### Ferebee Ave Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Ferebee Ave wet well is deteriorating.



Figure 110-3. Wet well Photo No.1



Figure 110-4. Wet well Photo No.2



**Ferebee Ave Lightning Protection Field Observations:**

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Bubbler control panel is not protected with surge suppression
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment Properly Grounded:
  - Motor starters & MMPS are not properly bonded to the station grounding system

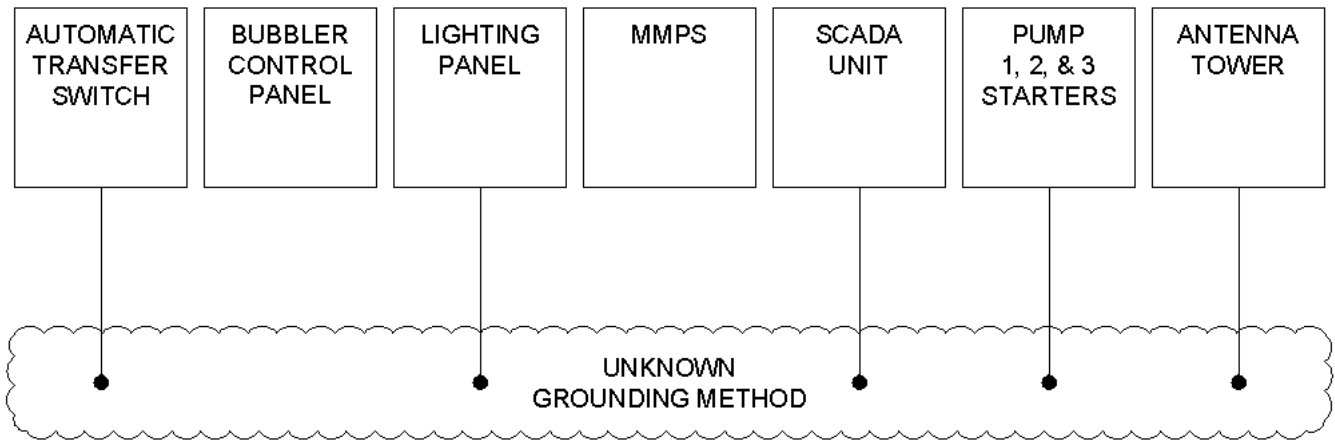


Figure 110-5. Ferebee Ave Grounding System

**Ferebee Ave Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly

- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 111 Granby Street Pump Station

### Granby Street Facility Description

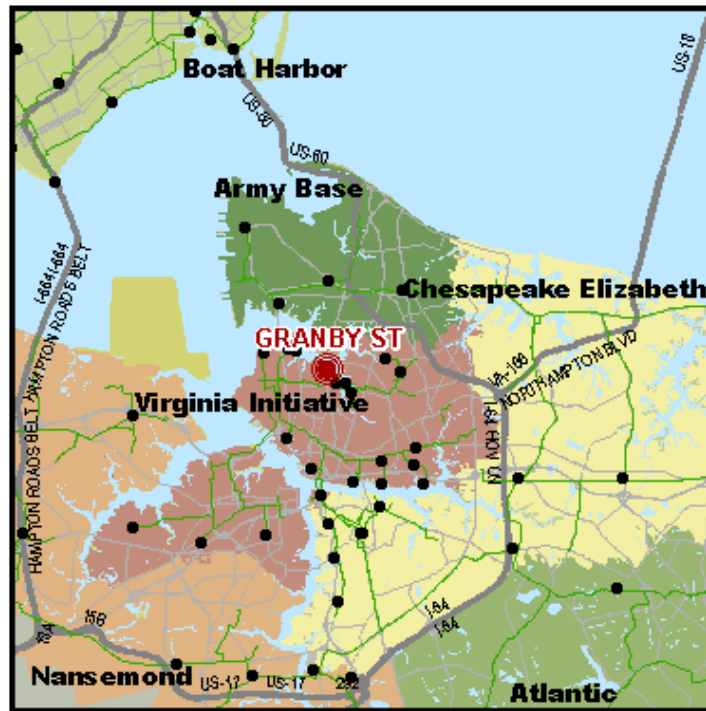


Figure 111-1. Granby Street Location Map



Figure 111-2. Granby Street Pump Station

<b>Table 111-1. Granby St PS</b>	
<b>Pumping Facility Number</b>	<b>111</b>
<b>Date of Initial Inspection</b>	<b>6/22/2008</b>
<b>Date of Update Inspection</b>	<b>6/23/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/7/2011</b>
<b>Date of Construction</b>	<b>1977</b>
<b>Address</b>	<b>4244 Granby Street, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>30 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>600 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>1200 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Submersible</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>600 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Motor Nameplate Power (HP)</b>	<b>8</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Granby Street Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

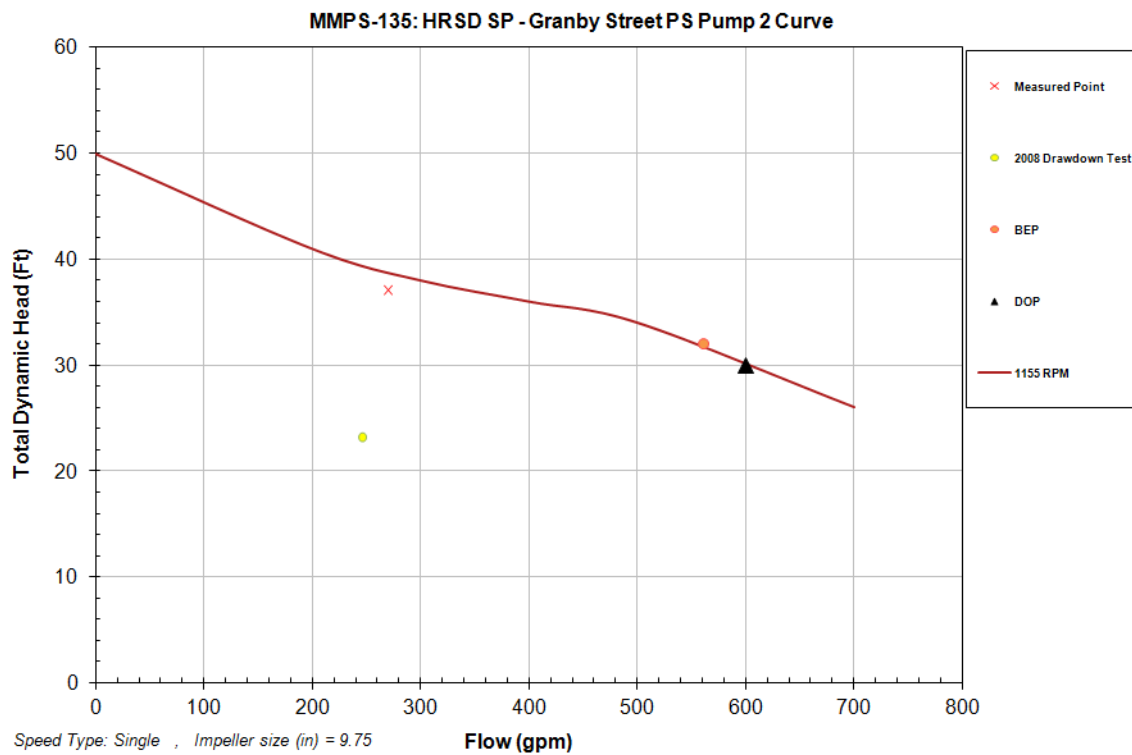
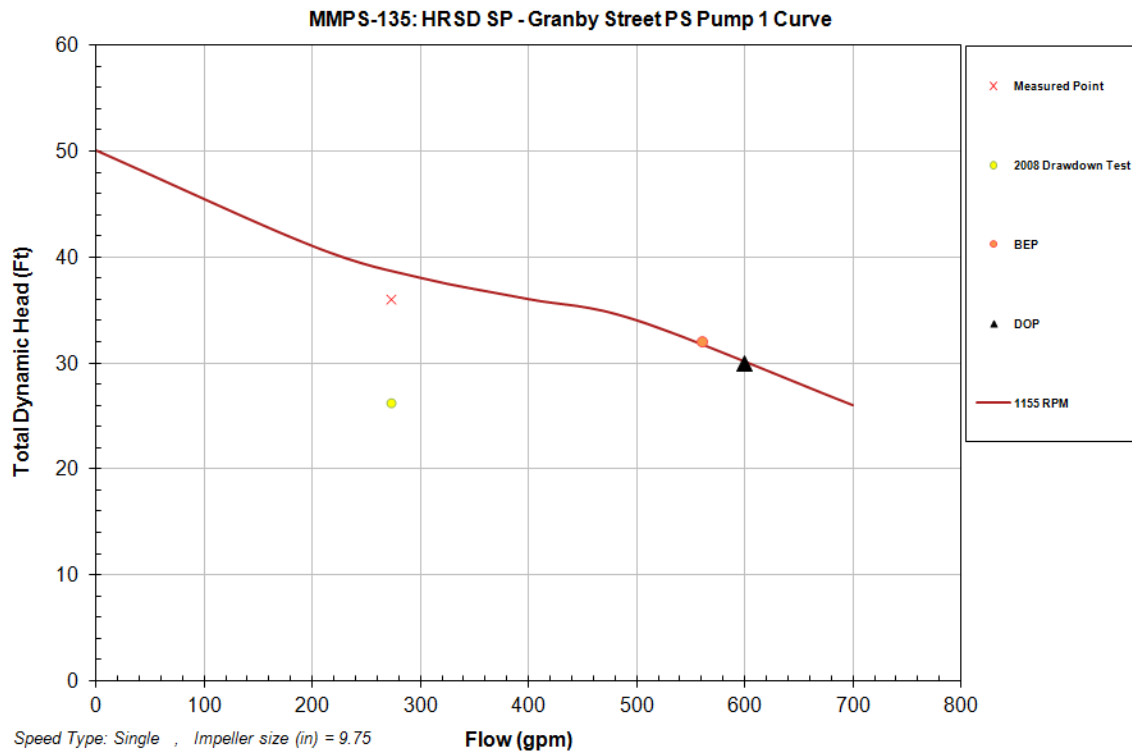
Table 111-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
111	Granby Street	Wet well	Wet well	2	2	Good	No Immediate Action Required	Aggregate visible. Hatch frame corroding. 5/2012: HRSD PM inspection on 01/26/2012 indicates no major changes from the 2008 wet well data.	1
111	Granby Street	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
111	Granby Street	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
111	Granby Street	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
111	Granby Street	Pump 1	Pump	2	1	Good	No Immediate Action Required	No Comment	1
111	Granby Street	Pump 2	Pump	2	1	Good	No Immediate Action Required	No Comment	1
111	Granby Street	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	9/09: Replaced #1 discharge valve. Check valves are deragged two times each week. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
111	Granby Street	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
111	Granby Street	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
111	Granby Street	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
111	Granby Street	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 111-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
111	Granby Street	Electrical Equipment	Electrical Equipment	3	2	Panel Corroded Dust Inside Panel	Continue Scheduled Maintenance Activities	Cabinet pitting. No backup power source or power feed hookup. Panel is unkempt. A wire & conduit entering the panel have been improperly installed.	2
111	Granby Street	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Analog gauge/control	2
111	Granby Street	Bubbler Panel	Bubbler Panel	3	2	None to Report	Continue Scheduled Maintenance Activities	No Comment	2
111	Granby Street	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
111	Granby Street	MMPS	MMPS	2	1	No panel door grounding wire is installed. Panel has corrosion on the inside. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1
111	Granby Street	SCADA	SCADA	2	1	No panel door grounding wire	No Immediate Action Required	No Comment	1

## Draw-Down Testing





### Granby Street Assets of Interest

The Granby Street wet well has some exposed aggregate.



Figure 111-3. Granby St Wet Well

### Granby Street Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Starter panel is not protected by a surge suppressor.
- Equipment Properly Grounded:
  - Transmitter panel, SCADA Unit, & MMPS are not bonded to the station grounding system.



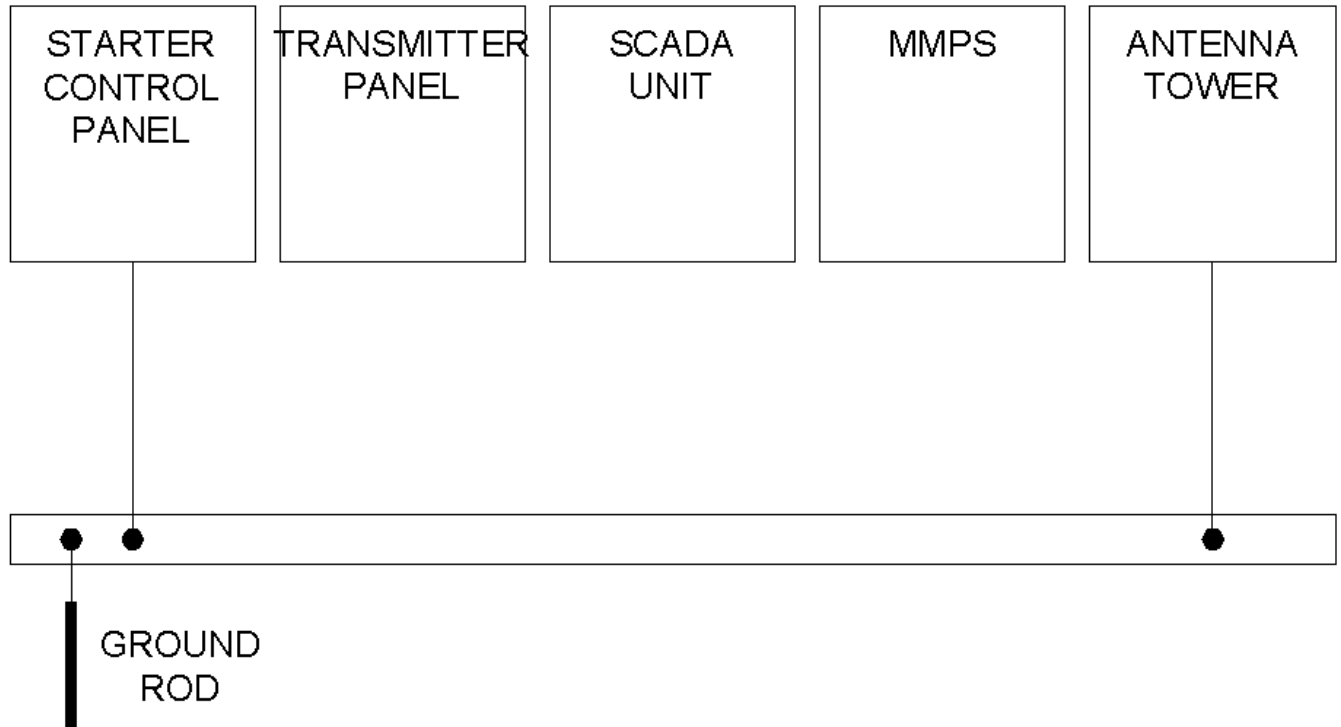


Figure 111-4. Granby Street Grounding System

**Granby Street Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact

- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other



<b>Table 112-1. Independence Blvd PRS</b>	
Pumping Facility Number	112
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/23/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/21/11
Date of Construction	1968
Address	4562 Southern Blvd, Virginia Beach
Receiving Facility	Chesapeake-Elizabeth Treatment Plant
Design Head (Feet)	60 ft.
Firm Pumping Capacity (GPM)	14000 GPM
Total Pumping Capacity (GPM)	28000 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Allis Chalmers
Pump Nameplate Capacity	14000 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric
Motor Nameplate Power (HP)	300
Generator Power (KW)	250

### Independence Blvd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 112-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
112	Independence Blvd	Building	Building	2	1	Good	No Immediate Action Required	Weeping at wall penetration on #2 pump discharge. 2 - 6 ton cranes.	1
112	Independence Blvd	HVAC System	HVAC System	2	3	Good	Continue Scheduled Maintenance Activities	Exhaust fan 1 made noise. Exhaust fan 2 appeared to be in service but the inspection crew could not get it to turn on.	2
112	Independence Blvd	Motor 1	Wastewater Pump Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Vibration visible when pump changes speeds. Could not run pumps long enough to get performance scores due to dry weather flow.	2
112	Independence Blvd	Motor 2	Wastewater Pump Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Did not run pump for 2011 assessment due to dry weather flow.	2
112	Independence Blvd	Pump 1	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Did not run long enough to get performance score due to dry weather conditions. Pump mounts are corroding. Mounting plates are bowed. Concrete legs have cracks.	2
112	Independence Blvd	Pump 2	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Did not run pump for 2011 assessment due to dry weather conditions. Pump mounts are corroding. Mounting plates are bowed. Concrete legs have cracks.	2
112	Independence Blvd	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

Table 112-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
112	Independence Blvd	Pump	Well Pump	2	1	Good	No Immediate Action Required	No Comment	1
112	Independence Blvd	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check Valve #2 performance not assessed because pump not run. 6/11: HRSD inspections indicate no problems with valve operation.	1
112	Independence Blvd	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
112	Independence Blvd	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
112	Independence Blvd	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
112	Independence Blvd	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
112	Independence Blvd	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
112	Independence Blvd	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
112	Independence Blvd	Electrical Equipment	Electrical Equipment	3	2	Panel Corroded Panel Obsolete Cables Fatigued and Cracked Dust Inside Panel	Continue Scheduled Maintenance Activities	Electrical junction box for sump pump is repaired with duct tape.	2
112	Independence Blvd	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1

**Table 112-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
112	Independence Blvd	Control Panel	Control Panel	3	2	Panel as well as all internal components are old & outdated. Panel wiring is unkempt.	Continue Scheduled Maintenance Activities	Consider upgrading control panel.	2
112	Independence Blvd	FLOmatcher	FLOmatcher	3	2	None to Report	Continue Scheduled Maintenance Activities	Equipment is well maintained but is old and should be considered for replacement.	2
112	Independence Blvd	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
112	Independence Blvd	SCADA	SCADA	2	1	No panel door grounding wire.	No Immediate Action Required	No Comment	1
112	Independence Blvd	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
112	Independence Blvd	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
112	Independence Blvd	Engine	Generator Drive Engine	3	1	Good Leaking Fluids	Continue Scheduled Maintenance Activities	No Comment	2
112	Independence Blvd	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
112	Independence Blvd	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
112	Independence Blvd	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
112	Independence Blvd	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

## Drawdown Testing

Not applicable.

## Independence Blvd Assets of Interest

Independence Blvd PRS uses Flomatcher pump controllers.



Figure 112-3. Independence Blvd Flomatchers

## Independence Blvd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Control panel & velocity profiler are not protected with surge suppression
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment Properly Grounded:
  - MMPS is not properly bonded to the station grounding system



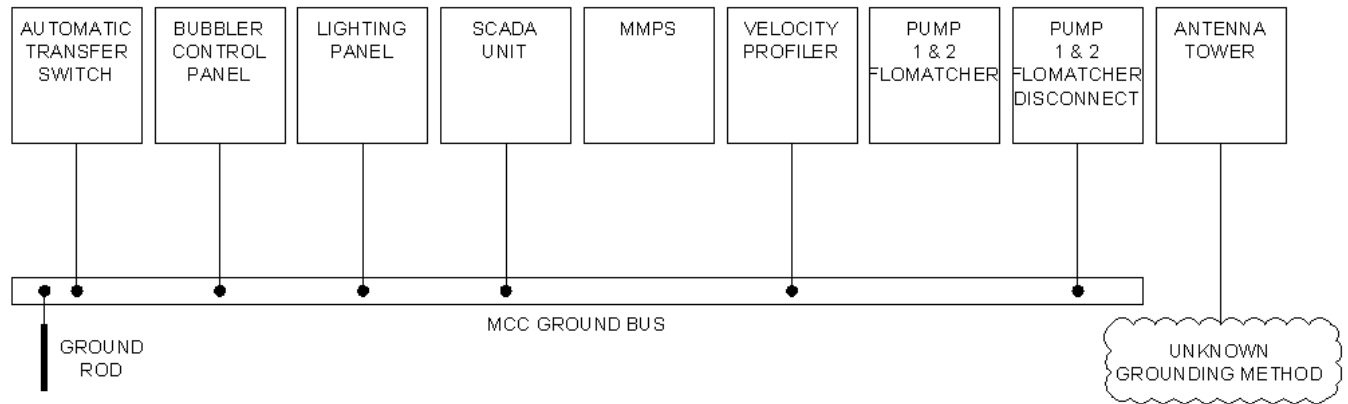


Figure 112-4. Independence Blvd Grounding System

**Independence Blvd Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 113 Luxembourg Ave Pump Station

### Luxembourg Ave Facility Description

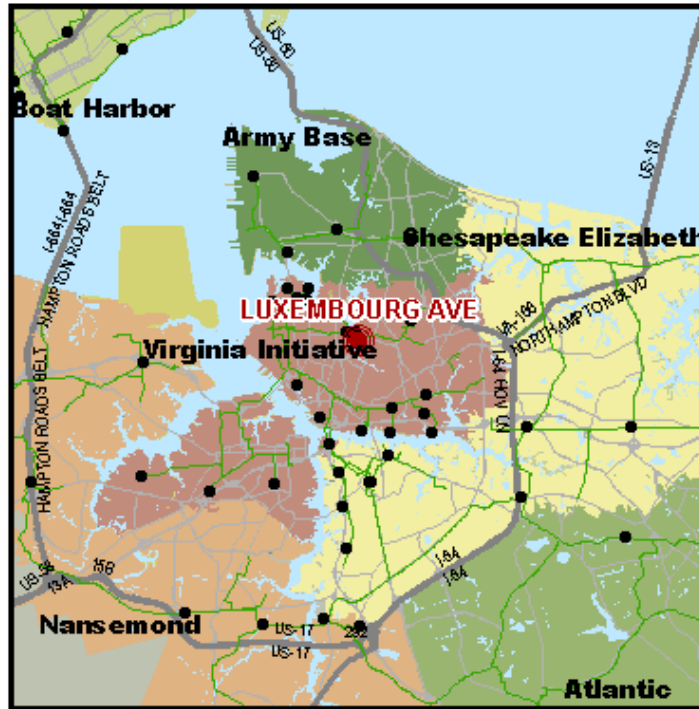


Figure 113-1. Luxembourg Ave Pump Station Location Map



Figure 113-2. Luxembourg Ave Pump Station

<b>Table 113-1. Luxembourg Ave PS</b>	
Pumping Facility Number	113
Date of Initial Inspection	6/22/2008
Date of Update Inspection	6/22/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/5/2011
Date of Construction	1962
Address	3030 Luxembourg Avenue, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	31 ft., 32 ft.
Firm Pumping Capacity (GPM)	6800 GPM
Total Pumping Capacity (GPM)	11200 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse (2), Chicago Pump (1)
Pump Nameplate Capacity	2800, 4400, 4000
Standby Pump(s) present during inspection	8" Godwin CD225M
Motor Manufacturer	Master Electric, U.S. Motor, Marathon Electric
Motor Nameplate Power (HP)	30, 50, 50
Generator Power (KW)	100

### Luxembourg Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 113-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
113	Luxembourg Avenue	Building	Building	4	3	Good	Schedule Corrective Action	Generator portion of building is separating from the motor room portion of the building. Godwin D8420 onsite. Dry well ceiling has some spalling.	3
113	Luxembourg Avenue	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	One fan out of service with motor removed. Dry well ventilation is weak.	1
113	Luxembourg Avenue	Wet well	Wet well	4	1	Exposed Rebar Concrete Spalding	Schedule Corrective Action	5/2012: HRSD PM inspection on 03/01/2012 indicates no major changes from the 2008 wet well data.	3
113	Luxembourg Avenue	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Motor 2	Wastewater Pump Motor and Controller	2	3	Good Makes Noise Vibrates	Continue Scheduled Maintenance Activities	Motor made noise. Visible vibration likely from shaft.	2
113	Luxembourg Avenue	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Pump 1	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	No nameplate data found. Suction size = 10", discharge size = 8". Minor shaft deflection likely causing minor vibration. Flow meter: 3200 gpm, 3.7 fps. Static pressure: 1.5 psi.	1

**Table 113-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
113	Luxembourg Avenue	Pump 2	Pump	2	3	Vibrating Shaft Deflection Cavitating	Continue Scheduled Maintenance Activities	No other nameplate info visible. Suction size = 10", discharge size = 8" Shaft deflection likely causing minor vibration. Pump made noises. Flow meter: 3200 gpm. 3.9 fps. The pump fittings and mounting are corroding despite painting.	2
113	Luxembourg Avenue	Pump 3	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	Suction size = 10", discharge size = 8". Other nameplate info illegible. Shaft deflection likely causing minor vibration. Knocking sound produced when pump winds down. Flow meter: 1000 gpm, 1.5 fps. Pipe support corroding. The pump fittings and mounting are corroding despite painting.	1
113	Luxembourg Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Suction Valves: #1 & #2: 14", #3: 16". Check valves; #1 & 2: 10", # 3: 8"; Discharge valves: #1: 10", #2 &3: 8". Check valve #1-hard slam on closure. Check valve #3-slight audible slam on closure. 6/11: HRSD inspections - no performance issues.	1
113	Luxembourg Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
113	Luxembourg Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 113-2. Pumping Facility Asset Condition and Performance Ratings

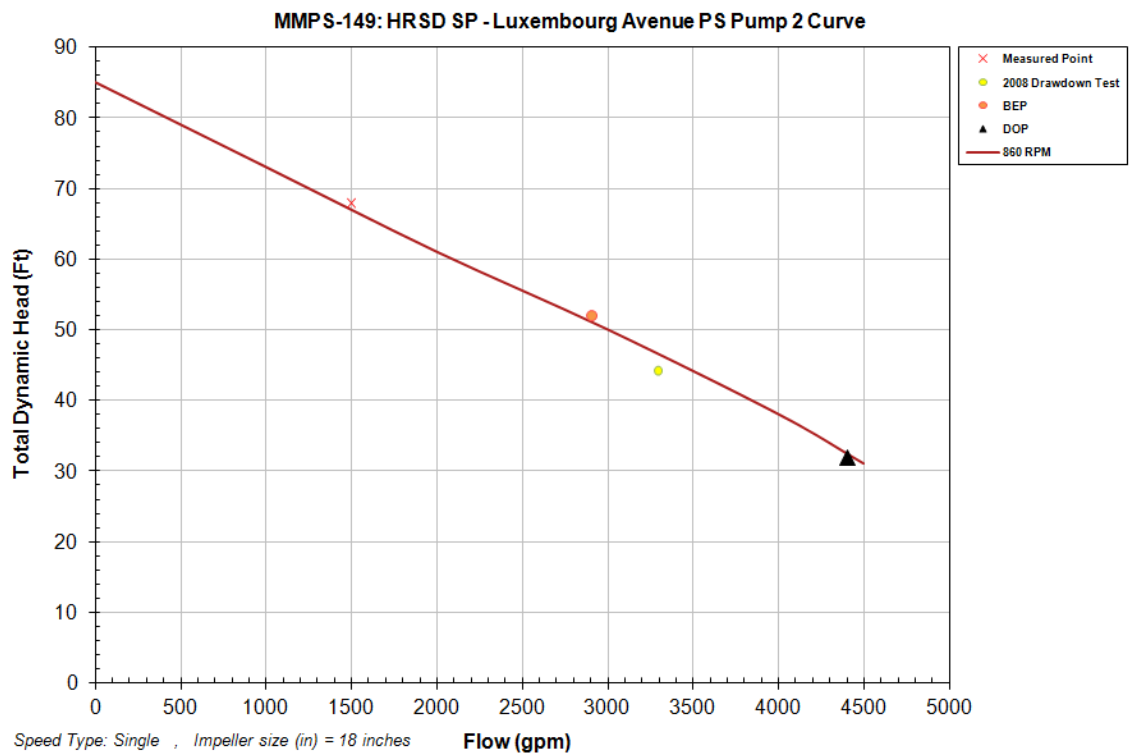
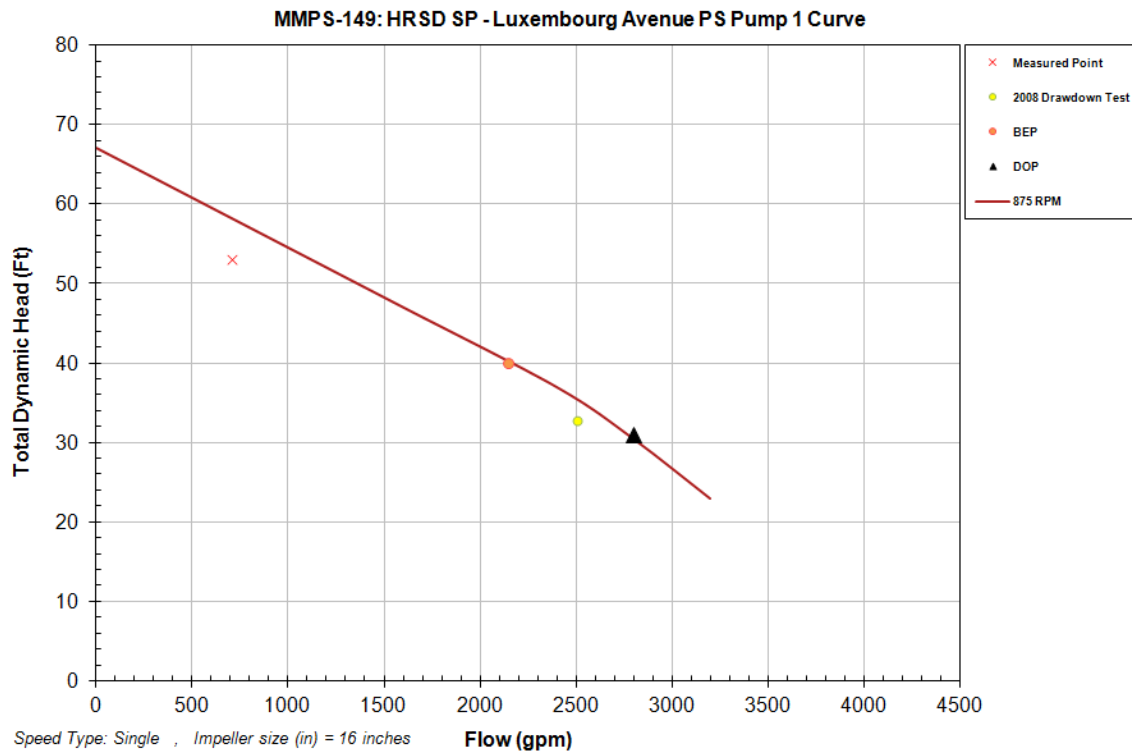
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
113	Luxembourg Avenue	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
113	Luxembourg Avenue	Check Valve Pump 1	Check Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
113	Luxembourg Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
113	Luxembourg Avenue	Check Valve Pump 3	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
113	Luxembourg Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
113	Luxembourg Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
113	Luxembourg Avenue	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
113	Luxembourg Avenue	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
113	Luxembourg Avenue	Bubbler Panel	Bubbler Panel	1	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1

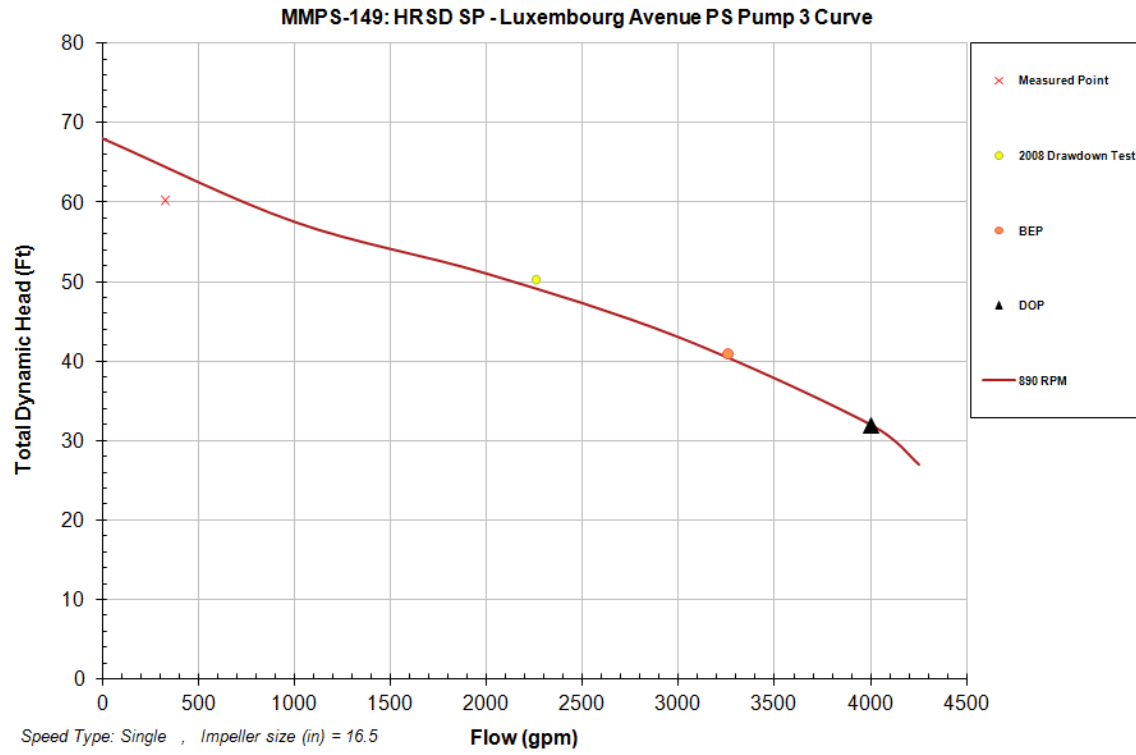
Table 113-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
113	Luxembourg Avenue	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Door difficult to close.	1
113	Luxembourg Avenue	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Recently replaced block heater. Asbestos exhaust wrap.	1
113	Luxembourg Avenue	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Tank 2	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
113	Luxembourg Avenue	Tank 3	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level. Observation well nearby.	1



### Draw-Down Testing





### Luxembourg Ave Assets of Interest

The Luxembourg Ave building appears to be experiencing differential settlement. After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Luxembourg Ave wet well is deteriorating.



Figure 113-3. Luxembourg Ave Building



Figure 113-4. Luxembourg Ave Wet Well Ceiling

### Luxembourg Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System

- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel & velocity profiler are not protected by a surge suppressor.
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system.

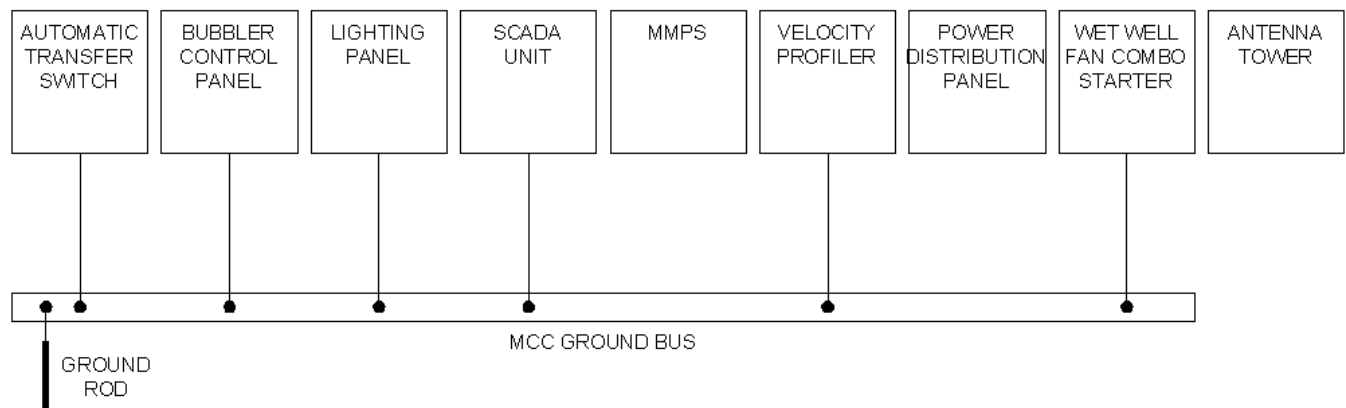


Figure 113-5. Luxembour Ave Grounding System

**Luxembour Ave Electrical Systems Field Observations:**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed

- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 114 Monroe Place Pump Station

### Monroe Place Facility Description

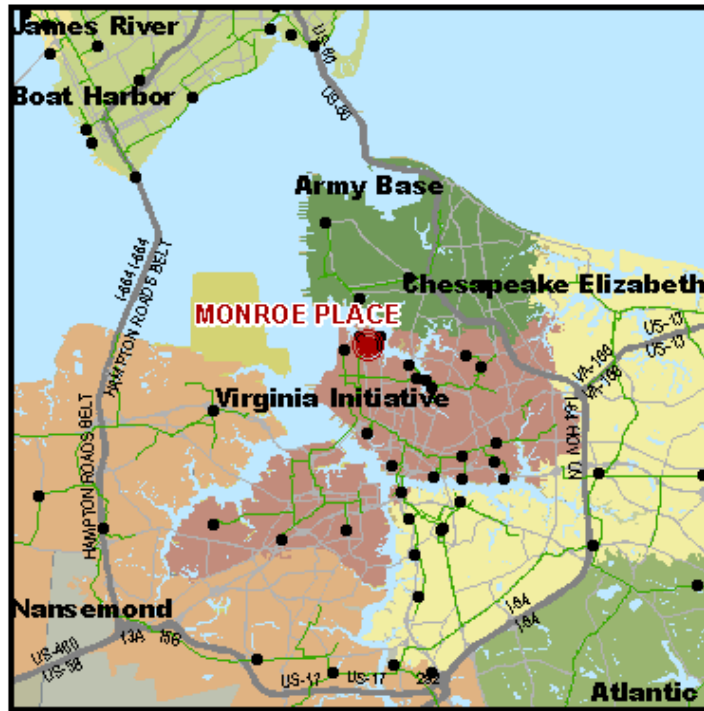


Figure 114-1. Monroe Place Pump Station Location Map



Figure 114-2. Monroe Place Pump Station

<b>Table 114-1. Monroe Place PS</b>	
<b>Pumping Facility Number</b>	<b>114</b>
<b>Date of Initial Inspection</b>	<b>6/23/2008</b>
<b>Date of Update Inspection</b>	<b>6/21/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/24/2011</b>
<b>Date of Construction</b>	<b>1953</b>
<b>Address</b>	<b>5808 Monroe Place, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>52 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>1200 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>2400 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>1200 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>6" Godwin CD150M</b>
<b>Motor Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Motor Nameplate Power (HP)</b>	<b>25</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Monroe Place Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.



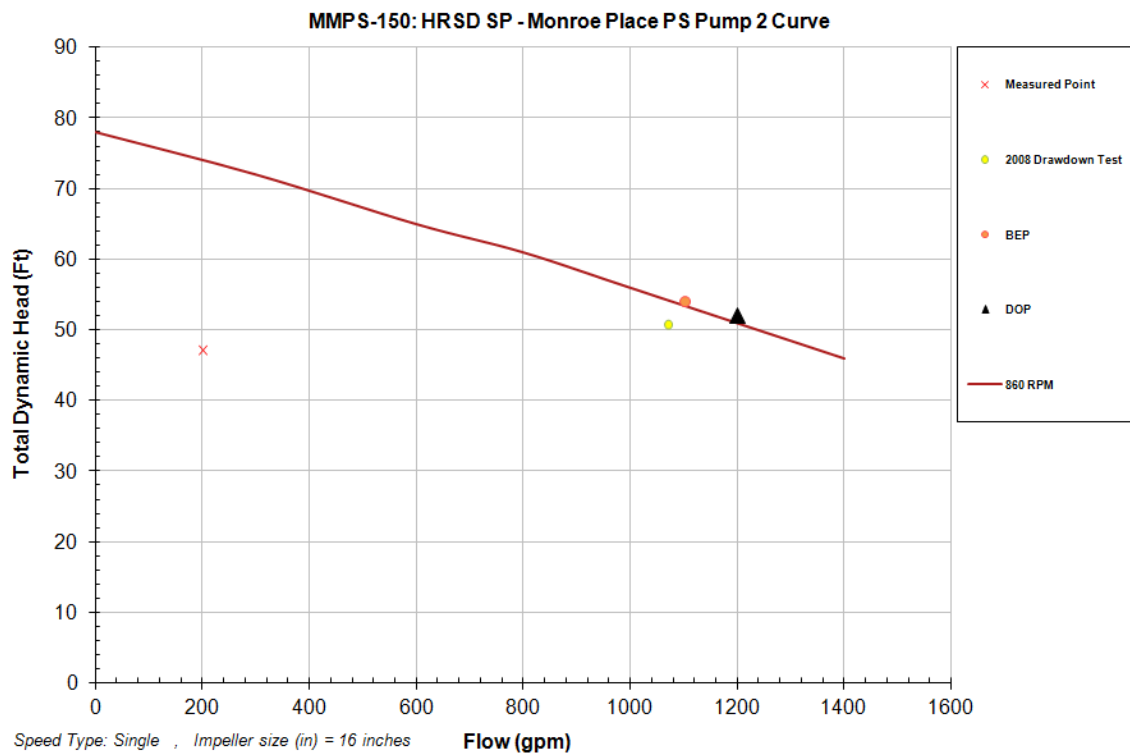
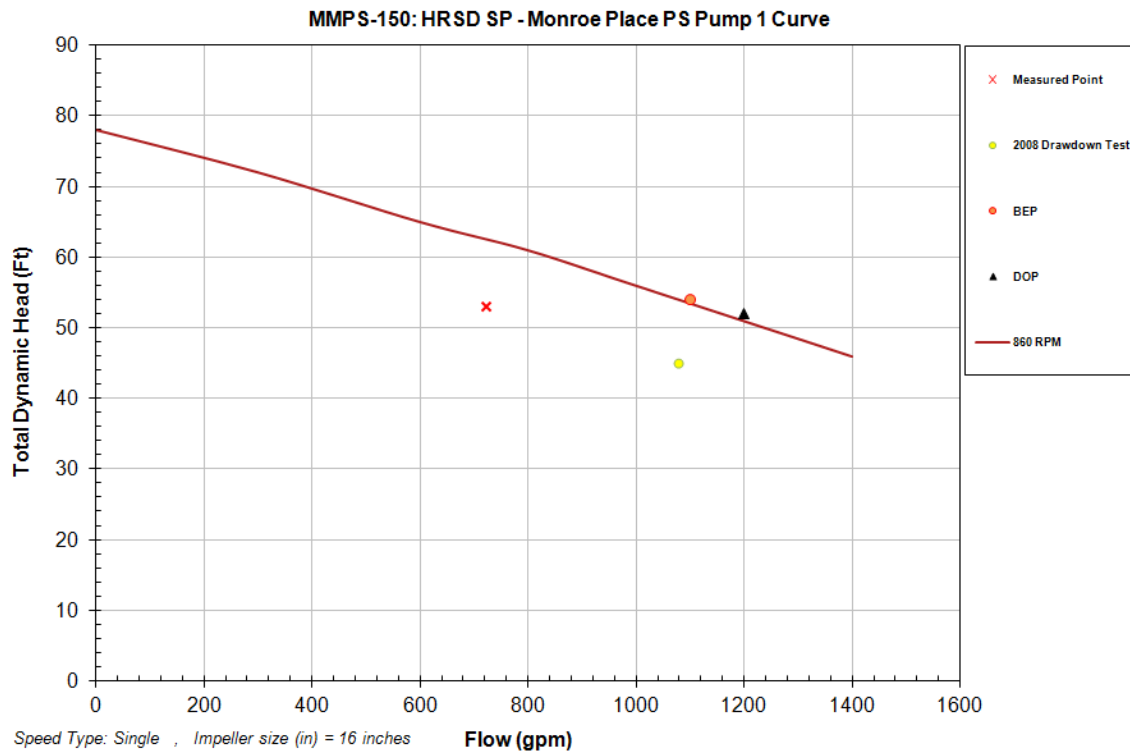
Table 114-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
114	Monroe Place	Building	Building	2	1	Good	No Immediate Action Required	Building has recently replaced windows. Godwin pump onsite (D61969)	1
114	Monroe Place	HVAC System	HVAC System	2	3	Good Low Detectable Airflow	Continue Scheduled Maintenance Activities	The dry well ventilation is weak. The motor room has passive ventilation only.	2
114	Monroe Place	Wet well	Wet well	3	3	Fair Scaling	Continue Scheduled Maintenance Activities	Liner from rehab beginning to erode. 5/2012: HRSD PM inspection on 02/03/2012 indicates no major changes from the 2008 wet well data.	2
114	Monroe Place	Motor 1	Wastewater Pump Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Slight Vibration. Electrical junction box not secure.	1
114	Monroe Place	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
114	Monroe Place	Pump 1	Pump	3	1	Good	Continue Scheduled Maintenance Activities	Shaft is noisy at startup and makes a clanking noise as pump winds down	2
114	Monroe Place	Pump 2	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Shaft deflection creates noise	2
114	Monroe Place	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
114	Monroe Place	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Lead joints prone to problems. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
114	Monroe Place	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
114	Monroe Place	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 114-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
114	Monroe Place	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
114	Monroe Place	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
114	Monroe Place	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
114	Monroe Place	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
114	Monroe Place	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No automatic back up power source.	1
114	Monroe Place	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
114	Monroe Place	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
114	Monroe Place	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
114	Monroe Place	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
114	Monroe Place	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
114	Monroe Place	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1

### Draw-Down Testing



### Monroe Place Assets of Interest

None.

### Monroe Place Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system.

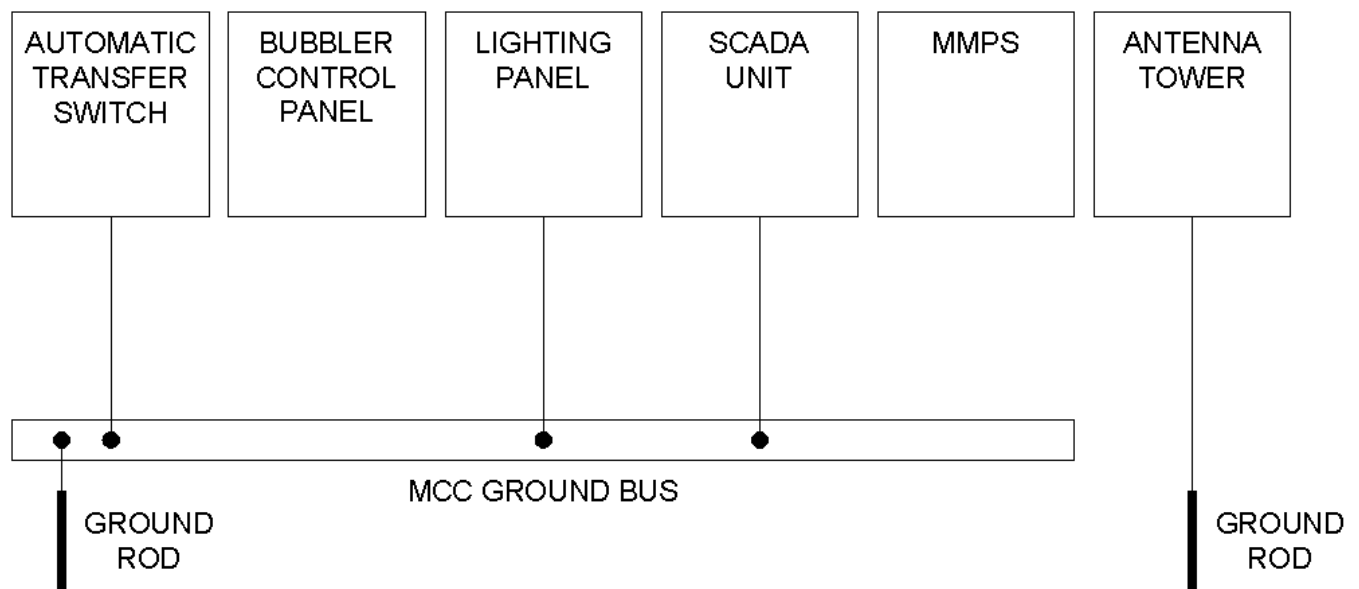


Figure 114-3. Monroe Place Grounding System

### Monroe Place Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)

- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

– No automatic back up power source

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## PS 115 Newtown Road Pump Station

### Newtown Road Facility Description



Figure 115-1. Newtown Road Pump Station Location Map



Figure 115-2. Newtown Road Pump Station

<b>Table 115-1. Newtown Rd PS</b>	
Pumping Facility Number	115
Date of Initial Inspection	6/27/2008
Date of Update Inspection	6/23/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/19/2011
Date of Construction	1967
Address	115 Newtown Road, Norfolk
Receiving Facility	Chesapeake-Elizabeth Treatment Plant
Design Head (Feet)	70 ft.
Firm Pumping Capacity (GPM)	10500 GPM
Total Pumping Capacity (GPM)	14000 GPM
Number of Pumps	4
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	3500 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric (1), Continental Electric (2), U.S. Motors (1)
Motor Nameplate Power (HP)	100
Generator Power (KW)	330

### Newtown Road Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



**Table 115-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
115	Newtown Road	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
115	Newtown Road	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Ozone generator. Third exhaust fan not found.	1
115	Newtown Road	Wet well	Wet well	4	1	Good	Corrective Action Required	Walls have T-Lock rehab. 6/2011: HRSD PM inspection on 4/12/2011 indicates no major changes from the 2008 wet well data. PM recommends paint for wet well hatch. Intermediate deck is deteriorating.	3
115	Newtown Road	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
115	Newtown Road	Motor 1	Wastewater Pump Motor and Controller	3	1	None to Report	Continue Scheduled Maintenance Activities	Motor 1, Low speed, high torque. Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. 3 rating due to possible oil leak.	2
115	Newtown Road	Motor 2	Wastewater Pump Motor and Controller	2	1	None to Report	No Immediate Action Required	Motor 2, Low speed, high torque. Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes.	1
115	Newtown Road	Motor 3	Wastewater Pump Motor and Controller	2	1	None to Report	No Immediate Action Required	Motor 3, Low speed, high torque. Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes.	1
115	Newtown Road	Motor 4	Wastewater Pump Motor and Controller	1	1	Good Higher than Expected Operating Temperature	No Immediate Action Required	Motor 4, low speed, high torque. Motor appears to be recently replaced. Gets hot in normal operation - can almost burn hand. Rated for inverter duty.	1

Table 115-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
115	Newtown Road	Pump 1	Pump	3	3	Vibrating Shaft Deflection Cavitating	Continue Scheduled Maintenance Activities	Pump made noises.	2
115	Newtown Road	Pump 2	Pump	2	2	Shaft Deflection	No Immediate Action Required	Slight shaft deflection is causing the safety cage to vibrate.	1
115	Newtown Road	Pump 3	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Base corroding. Stuffing box drain clogged.	1
115	Newtown Road	Pump 4	Pump	2	1	Good	No Immediate Action Required	Lead on day of inspection - running at 60%. Static pressure 8.5 psi. Pumping pressure 9.5 psi.	1
115	Newtown Road	Pump	Chemical Feed Pump	2	1	Good	No Immediate Action Required	Panel removed from box.	1
115	Newtown Road	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
115	Newtown Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Pump #1 discharge valve dripping. Check valve #4 audibly slammed shut. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
115	Newtown Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
115	Newtown Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

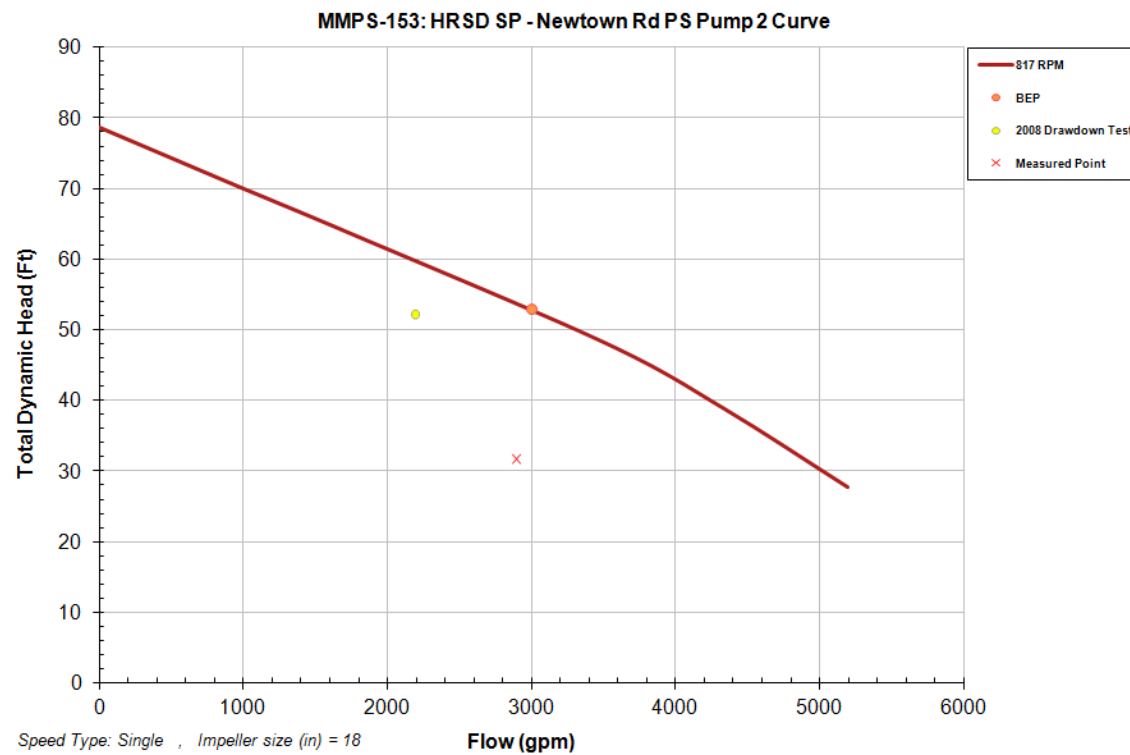
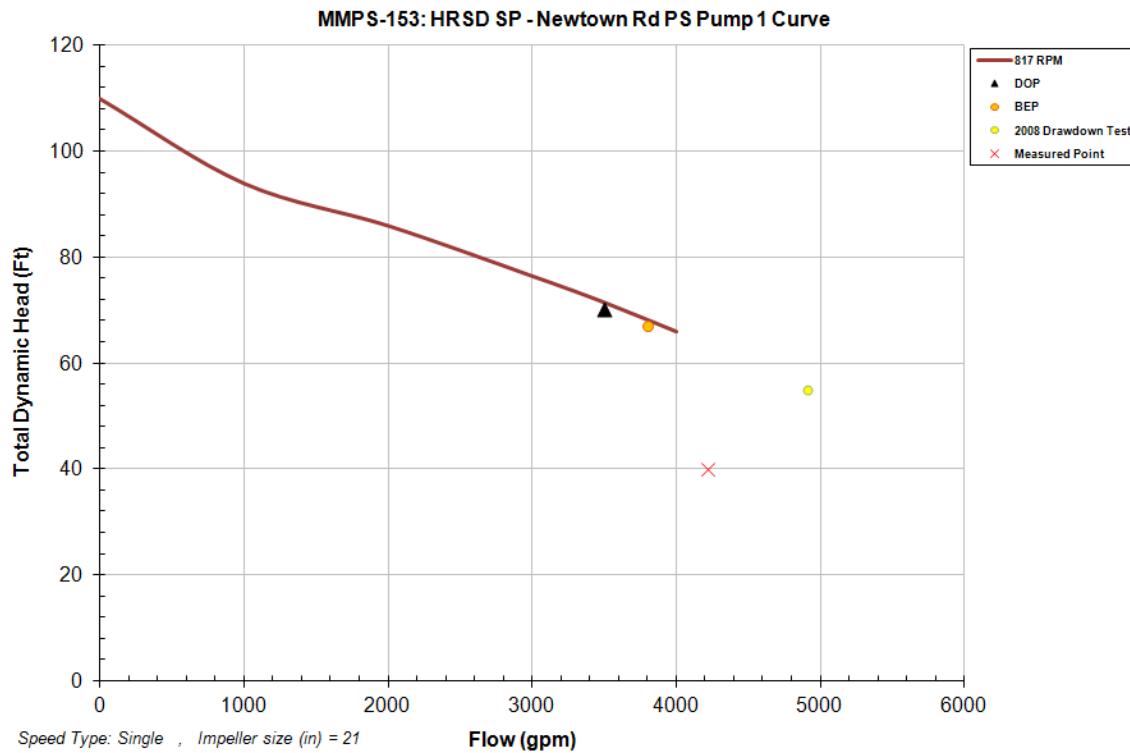
Table 115-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
115	Newtown Road	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Check Valve Pump 4	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
115	Newtown Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
115	Newtown Road	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete	Continue Scheduled Maintenance Activities	No Comment	2
115	Newtown Road	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
115	Newtown Road	Bubbler Panel	Bubbler Panel	2	2	No panel door grounding wire is installed.	No Immediate Action Required	Panel wiring is starting to become sloppy.	1
115	Newtown Road	FLOmatcher	FLOmatcher	3	2	None to Report	Continue Scheduled Maintenance Activities	Equipment is well maintained but is old and should be considered for replacement.	2

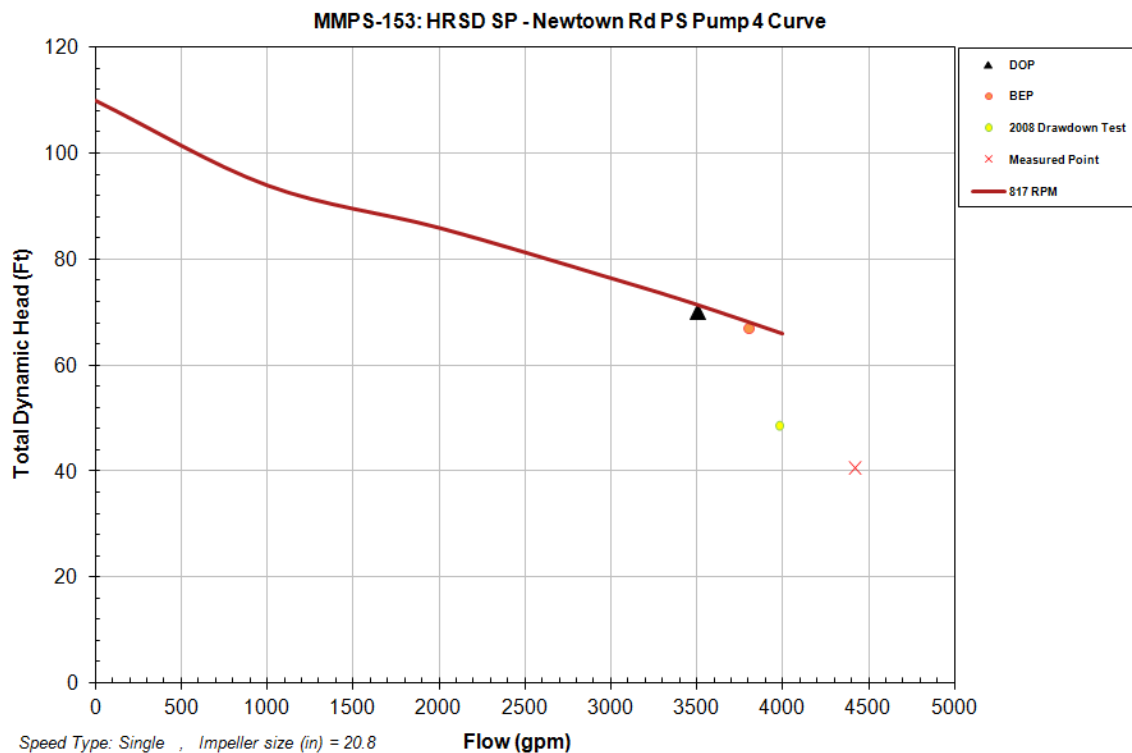
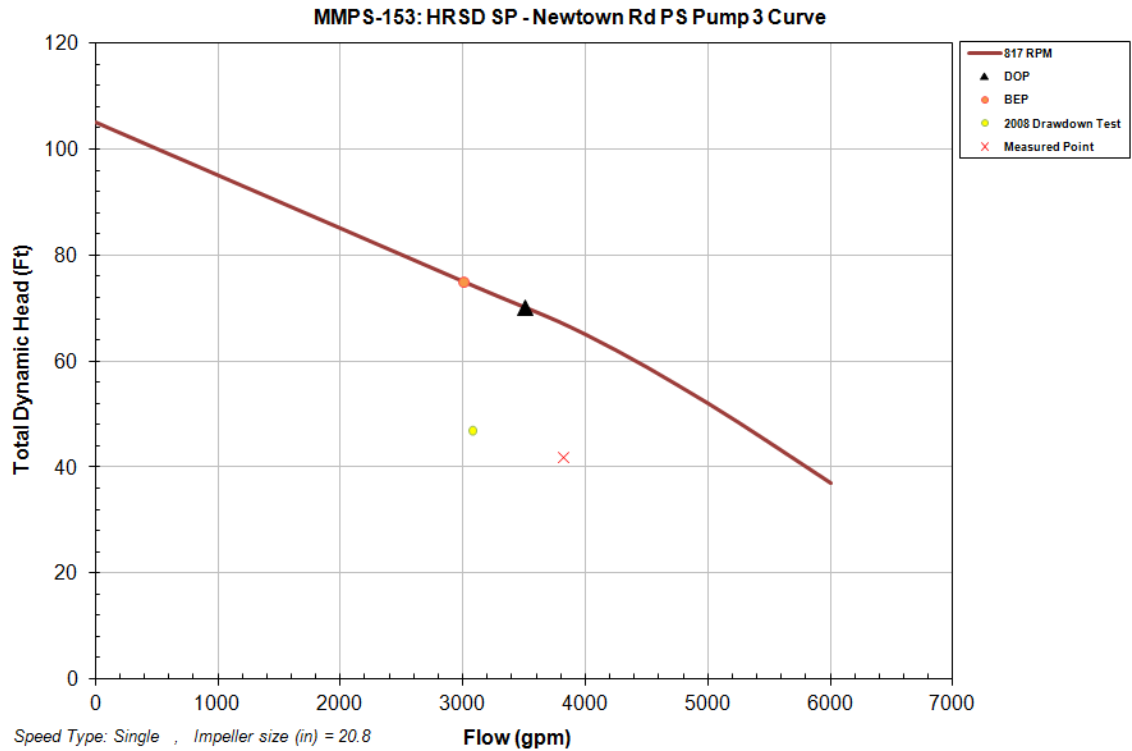
Table 115-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
115	Newtown Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
115	Newtown Road	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
115	Newtown Road	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
115	Newtown Road	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
115	Newtown Road	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Radiator appears to be recently replaced.	1
115	Newtown Road	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
115	Newtown Road	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
115	Newtown Road	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
115	Newtown Road	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

## Draw-Down Testing



DOP for 18 inch impeller was not provided by manufacturer.



Newtown Road PS uses variable speed Flomatcher pump controls which do not give a remote indication of pump shaft speed. The plotted curve is for the maximum pump shaft speed and the measured point was calculated from routine maintenance related wet well draw downs.

## Newtown Road Assets of Interest

Newtown Rd PS uses Flomatcher pump controllers. After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Newtown Rd wet well is deteriorating.



Figure 115-3. Newtown Rd Flomatcher



Figure 115-4. Newtown Rd Wet Well

**Newtown Road Lightning Protection Field Observations**

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel & velocity profiler are not protected by a surge suppressor.
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system.



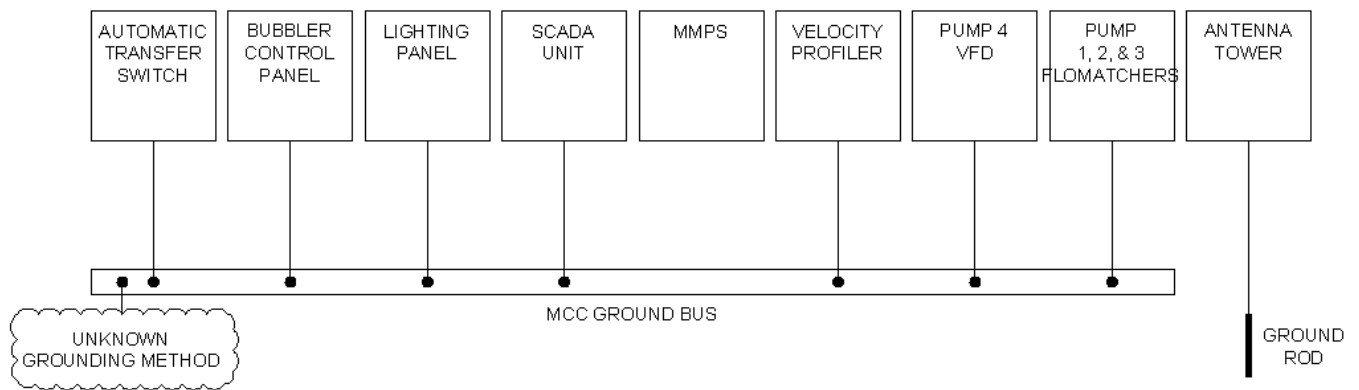


Figure 115-5. Newtown Rd Grounding System

**Newtown Road Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 116 Norchester St Pump Station

### Norchester St Facility Description



Figure 116-1. Norchester St. Pump Station Location Map



Figure 116-2. Norchester St Pump Station

<b>Table 116-1. Norchester St PS</b>	
Pumping Facility Number	116
Date of Initial Inspection	6/25/2008
Date of Update Inspection	6/21/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/18/2011
Date of Construction	1948
Address	935 Norchester Street, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	74 ft.
Firm Pumping Capacity (GPM)	3500 GPM
Total Pumping Capacity (GPM)	7000 GPM
Number of Pumps	2
Pump Type	Dry-pit Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	3500 GPM
Standby Pump(s) present during inspection	8" Godwin CD225M
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	95
Generator Power (KW)	None

### Norchester St Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 116-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
116	Norchester Street	Building	Building	3	1	None to Report	Continue Scheduled Maintenance Activities	Gantry appears obsolete. 8" Godwin pump onsite. (D8423)	2
116	Norchester Street	HVAC System	HVAC System	2	2	Low Detectable Airflow	No Immediate Action Required	Window A/C unit installed to handle electrical system/ motor heat. Vapex ozone generator onsite. The scrubber fan has been removed and the scrubber room has an out of service vent fan. The dry well ventilation is weak. 2 fans mounted in dry well for motors.	1
116	Norchester Street	Wet well	Wet well	4	4	Hatch Damaged or Difficult to open Concrete Spalling Concrete Corrosion	Replace/Refurbish	Manhole lid sealed with tar or similar synthetic. Severe delaminating corrosion inside wet well. High hydrogen sulfide measurements. Stations scheduled for replacement in the near term 6/2011: HRSD PM inspection on 4/08/2011 indicates no major changes from the 2008 wet well data.	5
116	Norchester Street	Motor 1	Wastewater Pump Motor	2	2	Good	No Immediate Action Required	Dry pit submersible. Loud motor buzz. Likely gets hot similar to motor 2 - test not long enough to verify. Ran at 56 Hz during test.	1
116	Norchester Street	Motor 2	Wastewater Pump Motor	2	2	Higher than Expected Operating Temperature	No Immediate Action Required	Dry pit submersible. Motor hot to touch. Loud motor buzz. Lead on the day of test. Ran at 56 Hz during test.	1
116	Norchester Street	Pump 1	Pump	2	2	Good	No Immediate Action Required	Not all nameplates verified, nameplate dirty/ missing. Pump made noises.	1
116	Norchester Street	Pump 2	Pump	2	1	Good	No Immediate Action Required	Not all nameplates verified, nameplate dirty/missing.	1

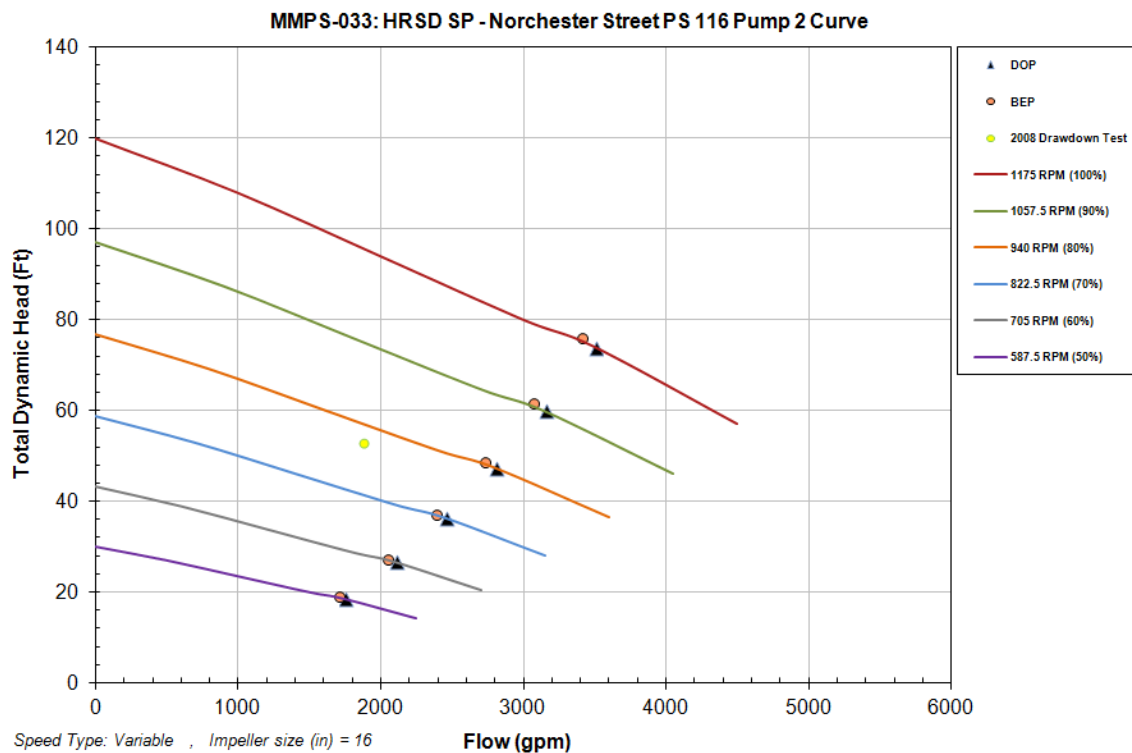
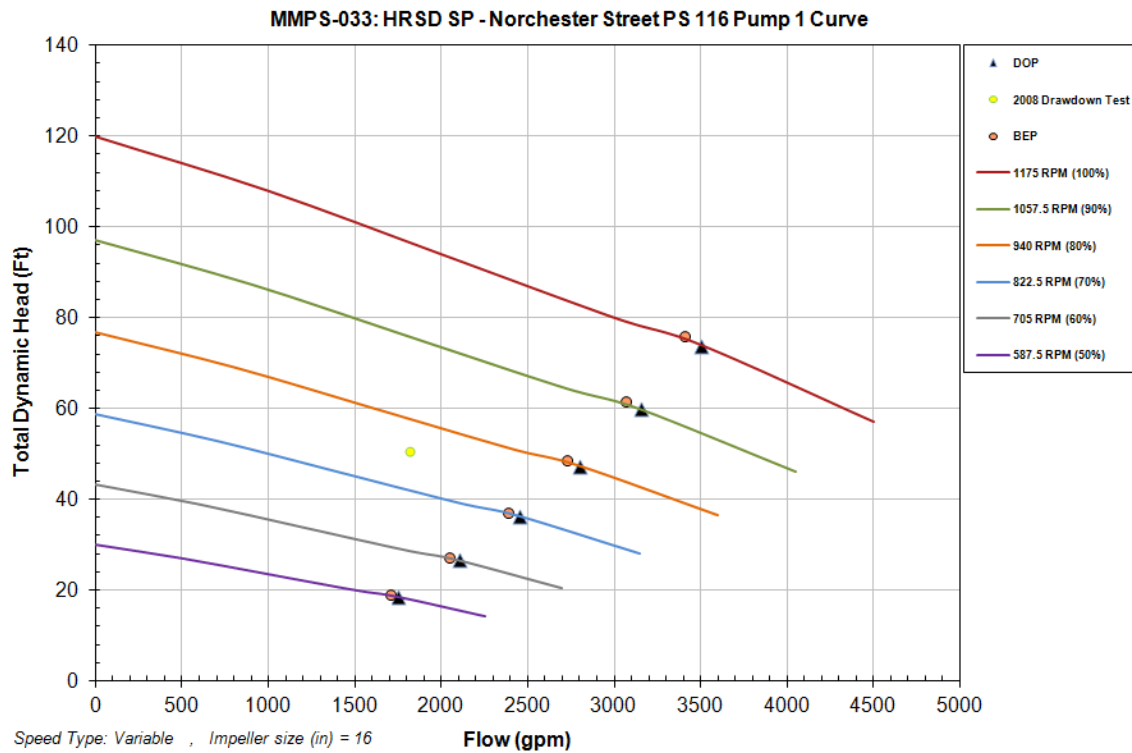
**Table 116-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
116	Norchester Street	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
116	Norchester Street	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
116	Norchester Street	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
116	Norchester Street	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
116	Norchester Street	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
116	Norchester Street	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
116	Norchester Street	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
116	Norchester Street	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
116	Norchester Street	Electrical Equipment	Electrical Equipment	2	1	Cables Fatigued and Cracked	No Immediate Action Required	Excess heat handled by window A/C unit. Alternate power feed instead of standby generator. Pump wiring not hung properly.	1
116	Norchester Street	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	HRSD-built panel	1
116	Norchester Street	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed. Uncapped wires in the panel.	No Immediate Action Required	No Comment	1
116	Norchester Street	VFD	VFD	2	1	Some Corrosion on BUS bar	No Immediate Action Required	No Comment	1

**Table 116-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
116	Norchester Street	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
116	Norchester Street	MMPS	MMPS	1	1	No panel door grounding wire is installed.	No Immediate Action Required	No Comment	1
116	Norchester Street	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled. Uncapped wires in the panel. Corrosion forming in the panel.	No Immediate Action Required	No Comment	1
116	Norchester Street	Transfer Switch	Transfer Switch	2	1	Good Switch Corroded	No Immediate Action Required	No Comment	1

### Draw-Down Testing



Norchester St PS does not have a flow meter to calculate the measured point.



## Norchester Street Assets of Interest

The Norchester St wet well is corroding.



Figure 116-3. Norchester St Wet well

### Norchester Street Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Odor control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system

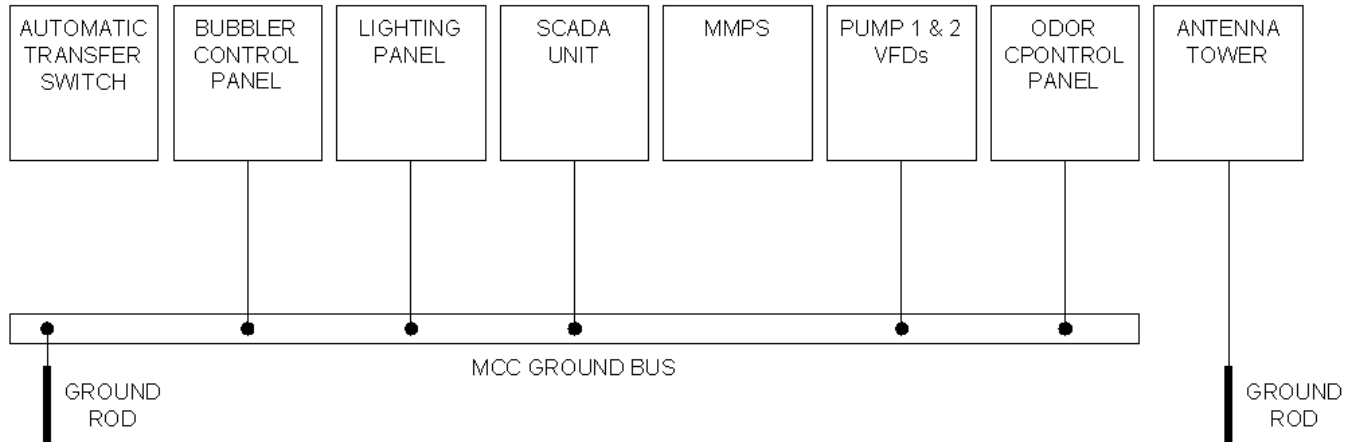


Figure 116-4. Norchester St Grounding System

### Norchester Street Electrical Systems Field Observations

- Good
  - N/A
  - Panel Corroded
  - Panel Obsolete
  - Contacts Loose
  - Cables Fatigued and Cracked
  - Dust Inside Panel
  - Bare Wires
  - Switch Gear Worn
  - Cooling Fan Filter Old/Clogged (If Present)
  - Adequate Workspace around Equipment
  - Equipment not damaged
  - Exterior Free of Debris, Dust, & Obstructions
  - Exterior Paint Conditions Adequate
  - Adequate Illumination Available
  - Equipment is Labeled Correctly
  - Required nameplates and signage readable
  - Equipment Labeled Where it is being Fed From
  - Equipment Properly Grounded
  - Correct Voltage Warning Signs
  - Doors Close Properly
  - Conduit Entrances are not obstructed
  - Conduits Entering from Outside are Sealed
  - Circuit Breakers Labeled Correctly with Loads
  - Breaker Handle and Lock out Loop Intact
  - Equipment Accommodates Lock Out / Tag Out
  - Required Receptacles Provided
  - Necessary Disconnecting Means Provided
  - Buses Free of Corrosion
  - Lugs Free of Corrosion
  - Building Electrical Plans Provided
  - Other
- Alternate power feed instead of standby generator

### **Norchester Street Dual Power Feed Assessment**

Information obtained from the local electrical utility indicates that this station has redundant transformers each with a different circuit feeding it from the utility. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.

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## PS 117 North Shore Rd Pump Station

### North Shore Rd Facility Description

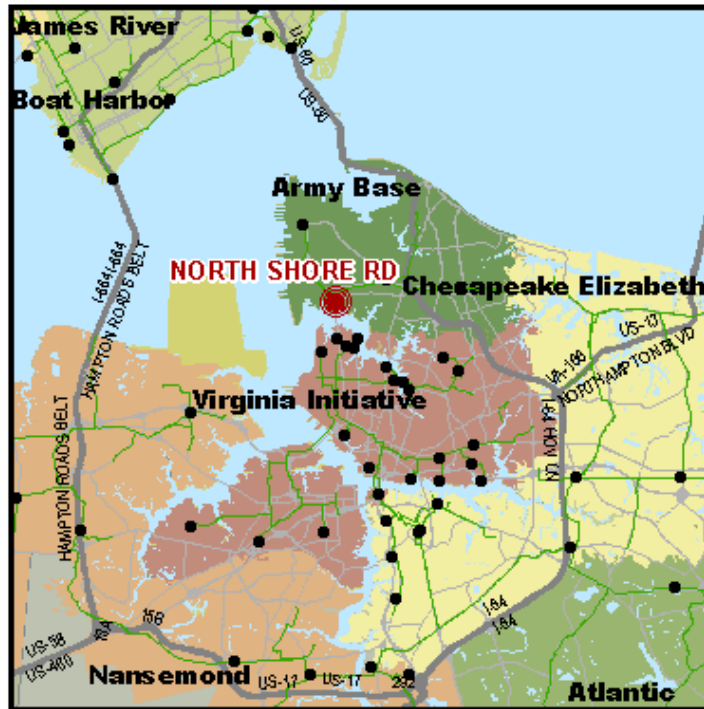


Figure 117-1. North Shore Road Pump Station Location Map



Figure 117-2. North Shore Rd Pump Station

<b>Table 117-1. North Shore Rd PS</b>	
<b>Pumping Facility Number</b>	<b>117</b>
<b>Date of Initial Inspection</b>	<b>6/23/2008</b>
<b>Date of Update Inspection</b>	<b>6/21/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/23/2011</b>
<b>Date of Construction</b>	<b>1949</b>
<b>Address</b>	<b>1510 1/2 North Shore Road, Norfolk</b>
<b>Receiving Facility</b>	<b>Army Base Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>65 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>800 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>1600 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Allis Chalmers</b>
<b>Pump Nameplate Capacity</b>	<b>800 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Master Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>25</b>
<b>Generator Power (KW)</b>	<b>80</b>

### **North Shore Rd Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 117-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
117	North Shore Road	Building	Building	2	1	Good	No Immediate Action Required	Slate roof. 3600 lb crane rail.	1
117	North Shore Road	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak. The motor room has passive ventilation only.	1
117	North Shore Road	Wet well	Wet well	4	1	Exposed aggregate	Schedule Corrective Action	Aggregate exposed depth between ½" and 1 ½" inches. 5/2012: HRSD PM inspection on 02/07/2012 indicates no major changes from the 2008 wet well data.	3
117	North Shore Road	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
117	North Shore Road	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
117	North Shore Road	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
117	North Shore Road	Pump 1	Pump	2	1	Good	No Immediate Action Required	Flow meter: 900 gpm, 5.0 fps. Pumps run at relatively low wet well level. Station has low flow. Static pressure: 7 psi.	1
117	North Shore Road	Pump 2	Pump	2	1	Good	No Immediate Action Required	Flow meter: 860 gpm, 5.4 fps. Pumps run at relatively low wet well level. Station has low flow.	1
117	North Shore Road	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
117	North Shore Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
117	North Shore Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 117-2. Pumping Facility Asset Condition and Performance Ratings

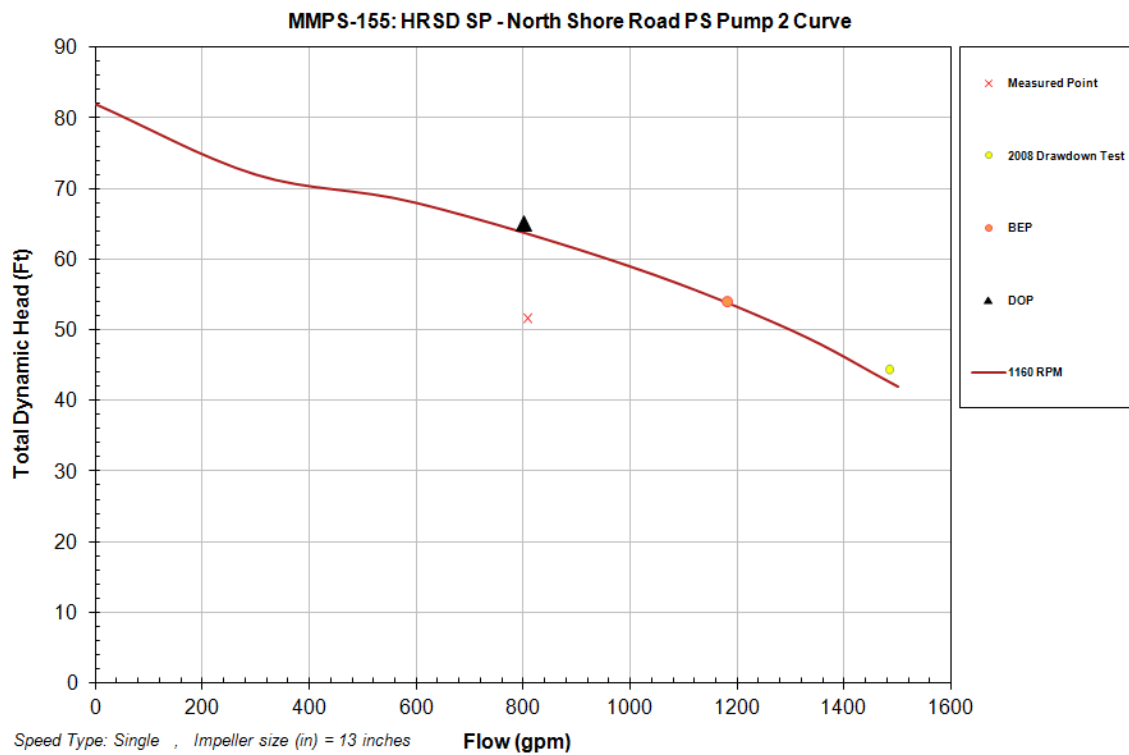
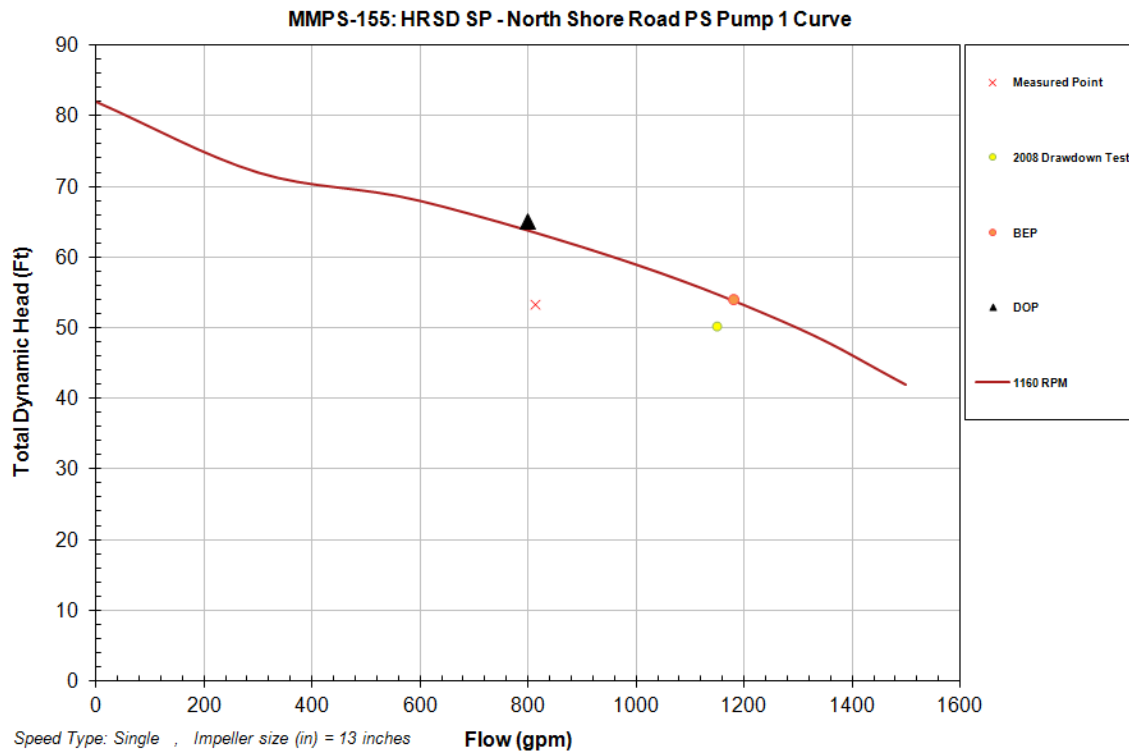
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
117	North Shore Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
117	North Shore Road	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
117	North Shore Road	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
117	North Shore Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
117	North Shore Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
117	North Shore Road	Electrical Equipment	Electrical Equipment	3	2	Switch Gear Worn	Continue Scheduled Maintenance Activities	No Comment	2
117	North Shore Road	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
117	North Shore Road	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed. Terminals not labeled.	No Immediate Action Required	No Comment	1
117	North Shore Road	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
117	North Shore Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
117	North Shore Road	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled. Interface panel is missing a latch.	No Immediate Action Required	No Comment	1
117	North Shore Road	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
117	North Shore Road	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1



**Table 117-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
117	North Shore Road	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
117	North Shore Road	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
117	North Shore Road	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1

## Draw-Down Testing



### North Shore Rd Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the North Shore Rd wet well is deteriorating.



Figure 117-3. North Shore Rd Wet Well Ceiling

### North Shore Rd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS, motor starters, ATS, & bubbler control panel are not bonded to the station grounding system

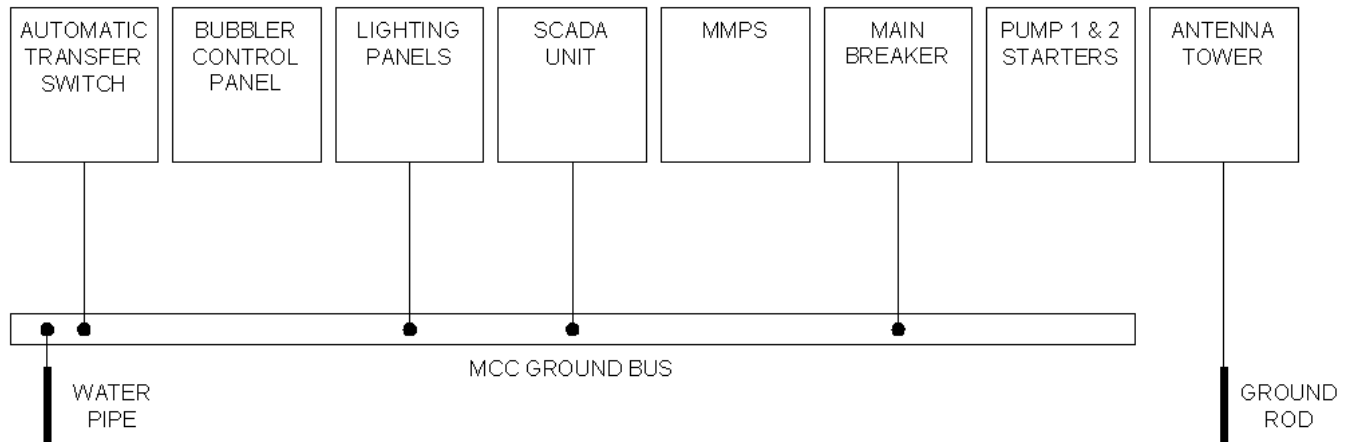


Figure 117-4. North Shore Rd Grounding System

### North Shore Rd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 118 Norview Ave Pump Station

### Norview Ave Facility Description



Figure 118-1. Norview Ave Pump Station Location Map



Figure 118-2. Norview Ave Pump Station

<b>Table 118-1. Norview Ave PS</b>	
<b>Pumping Facility Number</b>	<b>118</b>
<b>Date of Initial Inspection</b>	<b>6/22/2008</b>
<b>Date of Update Inspection</b>	<b>6/22/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/19/2011</b>
<b>Date of Construction</b>	<b>1955</b>
<b>Address</b>	<b>869 Norview Avenue, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>35 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>350 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>700 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>350 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Master Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>25</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Norview Ave Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 118-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
118	Norview Avenue	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
118	Norview Avenue	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak. Motor room has passive ventilation only.	1
118	Norview Avenue	Wet well	Wet well	4	3	Concrete Spalling	Schedule Corrective Action	Sluice gate repaired 02/07/2012. Some spalling on underside of intermediate deck and around flume side of wet well. 5/2012: HRSD PM inspection on 02/07/2012 indicates no major changes from the 2008 wet well data.	3
118	Norview Avenue	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
118	Norview Avenue	Motor 1	Wastewater Pump Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Slight vibration.	1
118	Norview Avenue	Motor 2	Wastewater Pump Motor and Controller	2	2	Good Vibrates	No Immediate Action Required	Slight vibration. Noisier than motor 1, likely from shaft.	1
118	Norview Avenue	Pump 1	Pump	3	2	Good	Continue Scheduled Maintenance Activities	Pump made noises but not necessarily indicative of mechanical issues. No other nameplate info found on pump. Stuffing box drain was plugged - Ops cleared. Flow meter: 500 gpm, 6 fps.	2
118	Norview Avenue	Pump 2	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Nameplate illegible. Pump made noises but not necessarily indicative of mechanical issues. Wet well was lower for test than pump 1. Flow meter: 400 gpm. Static pressure 4.5 psi.	1
118	Norview Avenue	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
118	Norview Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valve 1 closed well after pump stopped running. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
118	Norview Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

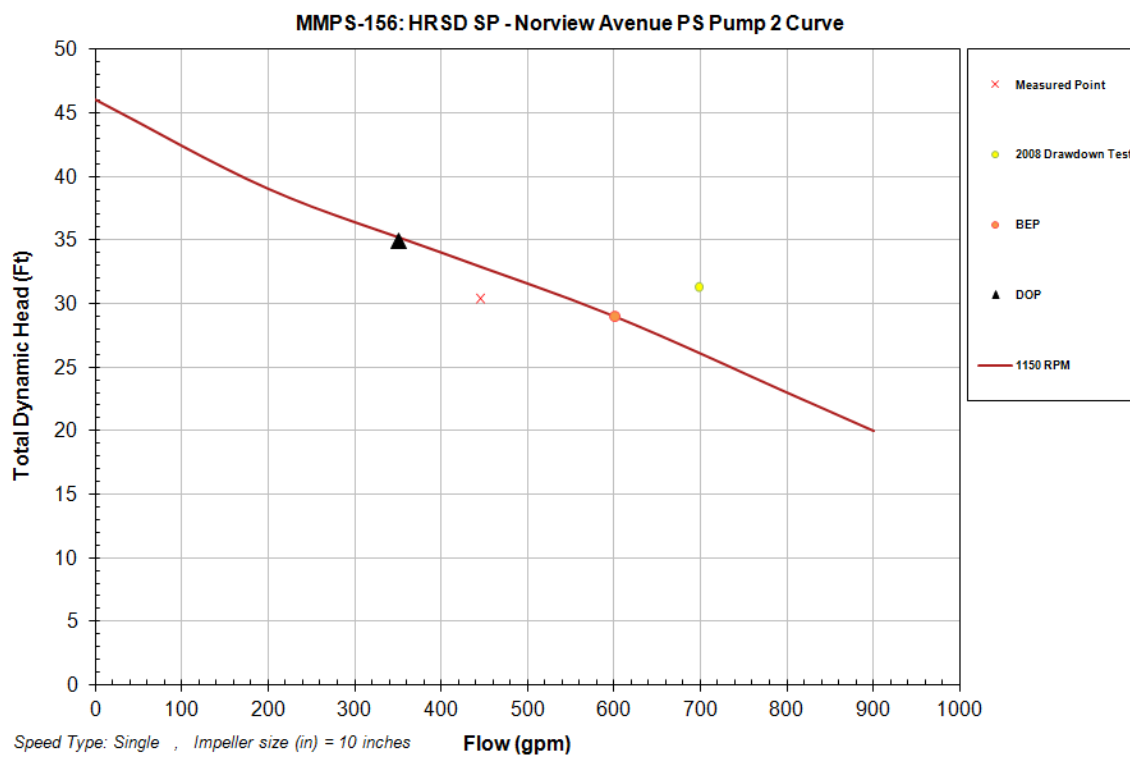
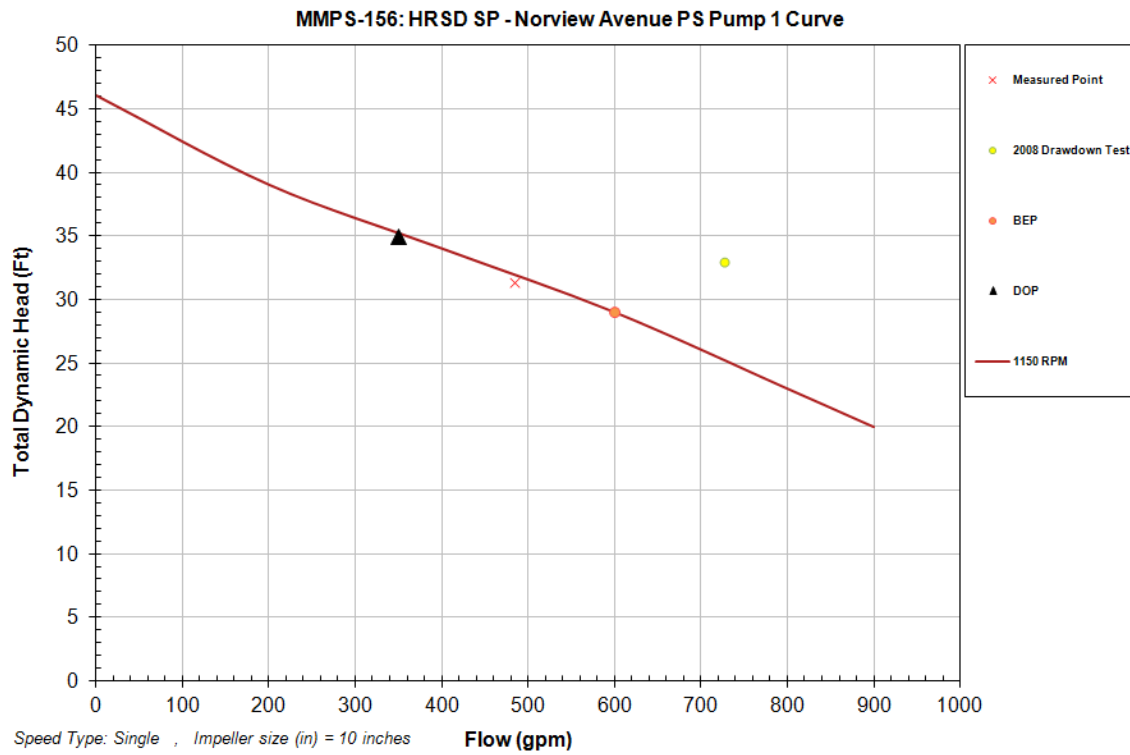


Table 118-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
118	Norview Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
118	Norview Avenue	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
118	Norview Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
118	Norview Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
118	Norview Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
118	Norview Avenue	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No automatic back up power source.	1
118	Norview Avenue	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
118	Norview Avenue	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
118	Norview Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
118	Norview Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
118	Norview Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
118	Norview Avenue	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Manual throw	1



## Draw-Down Testing



## Norview Ave Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Norview Ave wet well is deteriorating.



Figure 118-3. Typical Norview Ave Wet Well Concrete.

### Norview Avenue Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system

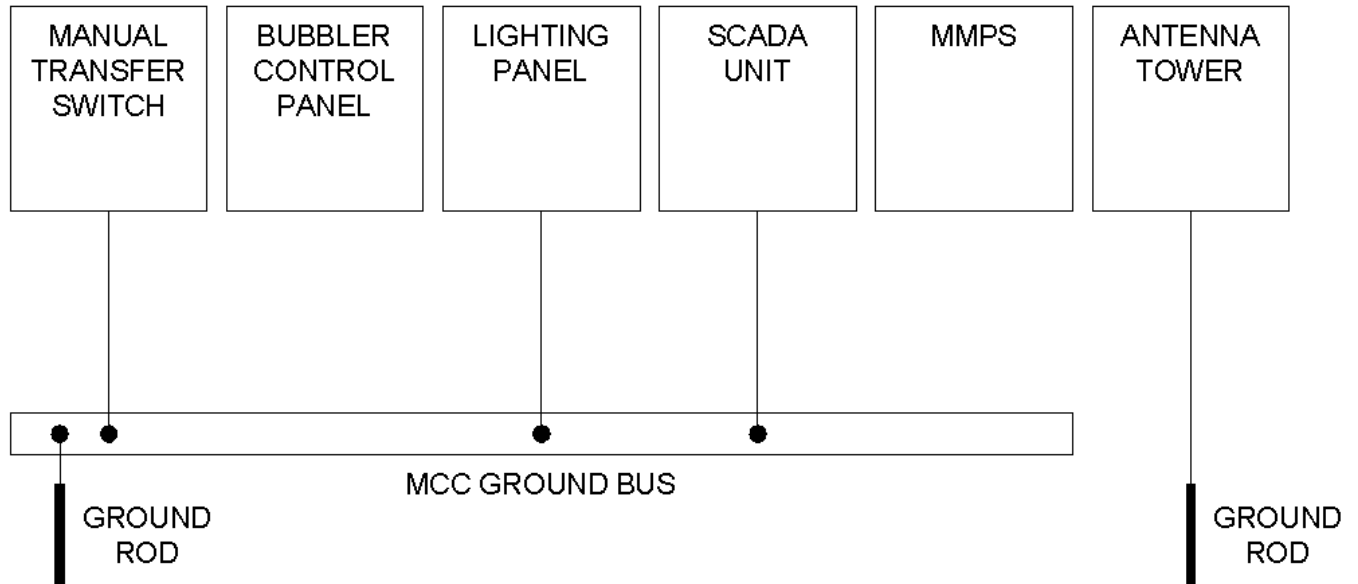


Figure 118-4. Norview Ave Grounding System

### Norview Avenue Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion

- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - No automatic back up power source

## PS 119 Park Ave Pump Station

### Park Ave Facility Description

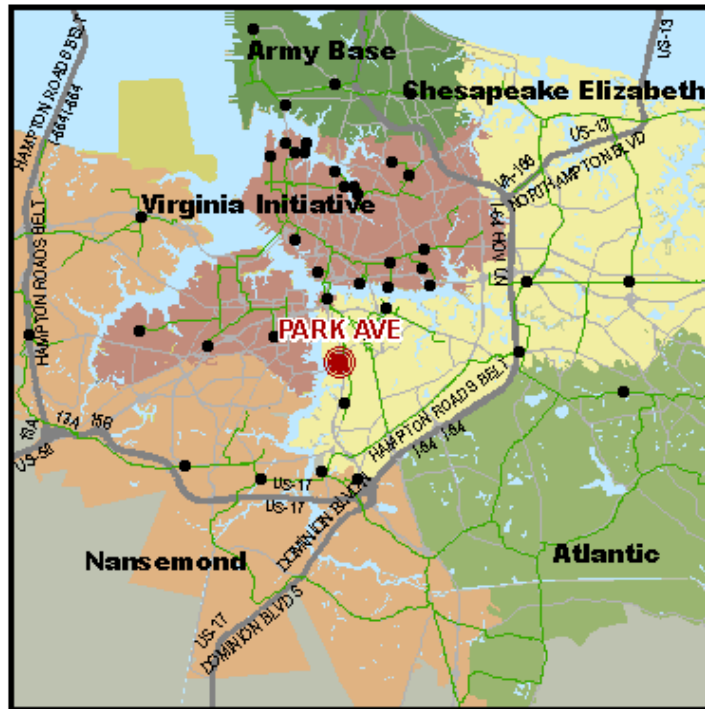


Figure 119-1. Park Ave Pump Station Location Map



Figure 119-2. Park Ave Pump Station

<b>Table 119-1. Park Ave PS</b>	
<b>Pumping Facility Number</b>	<b>119</b>
<b>Date of Initial Inspection</b>	<b>6/26/2008</b>
<b>Date of Update Inspection</b>	<b>6/10/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/20/2011</b>
<b>Date of Construction</b>	<b>1922</b>
<b>Address</b>	<b>503 Park Avenue, Chesapeake</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>32 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>3600 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>7400 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>3600 GPM, 3800 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>8" Godwin CD225M</b>
<b>Motor Manufacturer</b>	<b>General Electric, Westinghouse</b>
<b>Motor Nameplate Power (HP)</b>	<b>50</b>
<b>Generator Power (KW)</b>	<b>100</b>

### **Park Ave Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 119-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
119	Park Avenue	Building	Building	2	1	Good	No Immediate Action Required	Godwin pump onsite.	1
119	Park Avenue	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	1/6 HP HVAC motor. Dry well ventilation seems inadequate. HVAC motor producing an odor and a chattering noise. Could not find wet well fan only a vent line.	1
119	Park Avenue	Wet well	Wet well	2	1	Good	No Immediate Action Required	No ladder. Rehabilitated with a raised deck. 5/2012: HRSD PM inspection on 03/07/2012 indicates no major changes from the 2008 wet well data.	1
119	Park Avenue	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
119	Park Avenue	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
119	Park Avenue	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
119	Park Avenue	Pump 1	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	No Comment	2
119	Park Avenue	Pump 2	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Vibration and deflection minor. Has a larger shaft than pump 1. Pump lost prime during normal ops. HRSD restored prime during site visit - OPS reports that issue isn't typical. Stuffing box dry. Shaft makes clanging noise at startup.	2
119	Park Avenue	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

Table 119-2. Pumping Facility Asset Condition and Performance Ratings

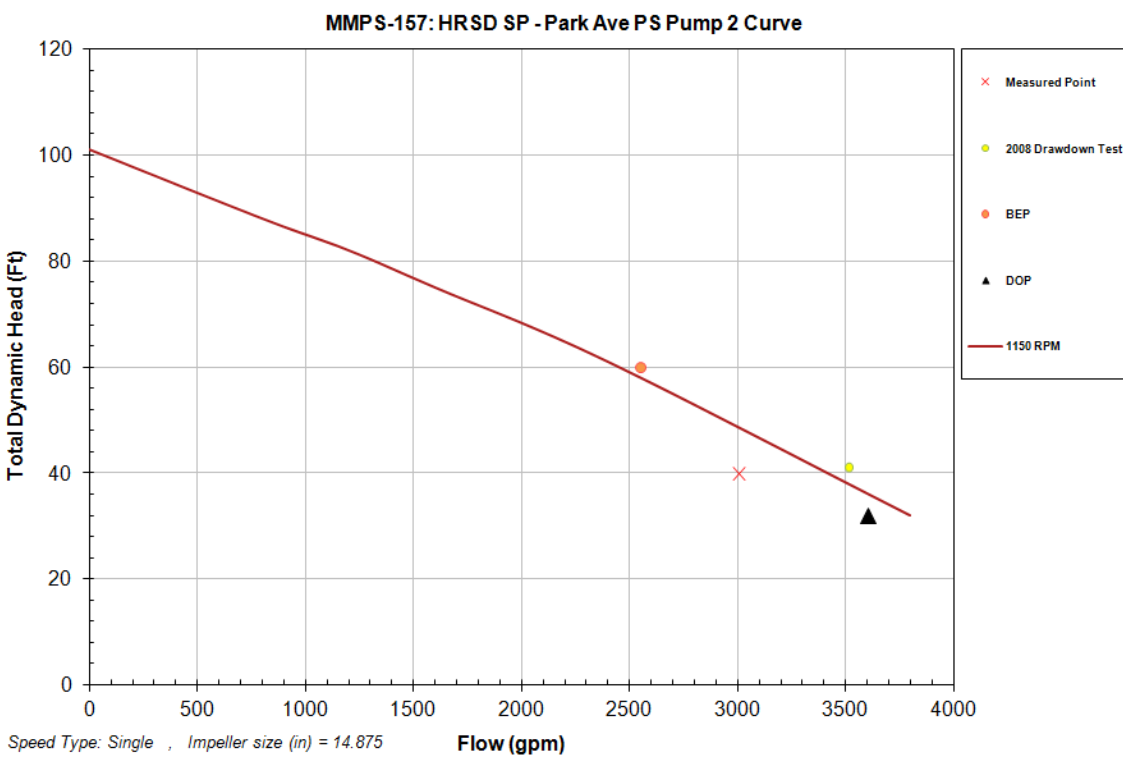
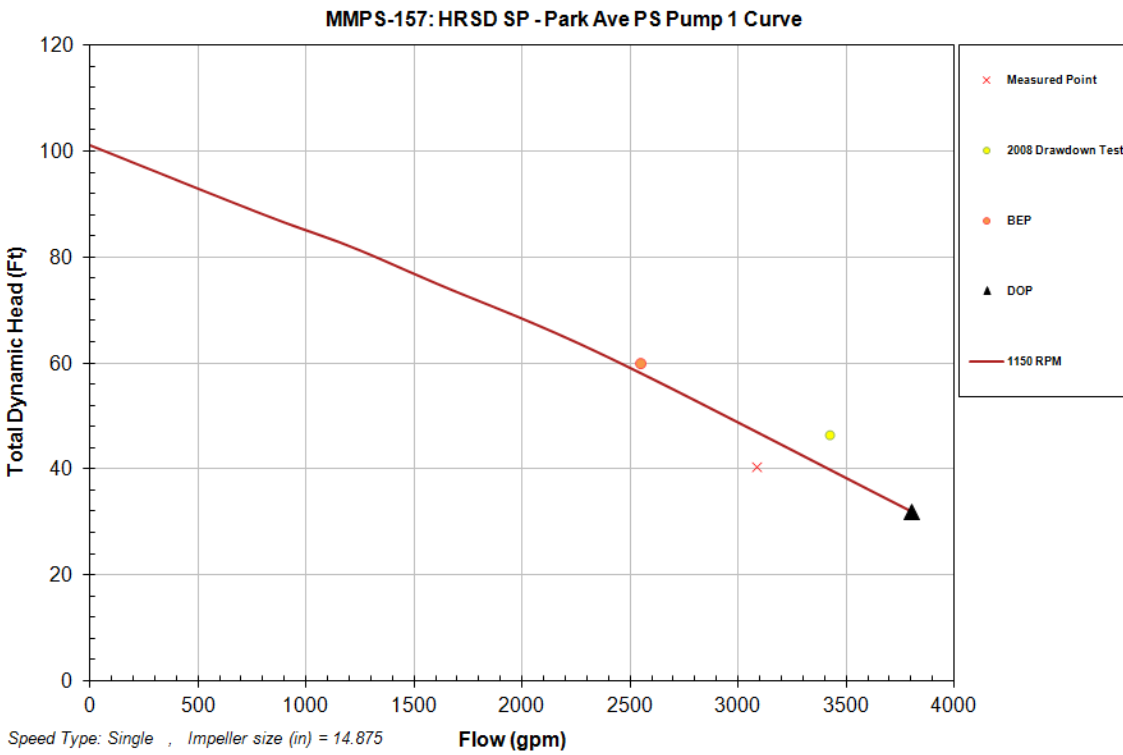
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
119	Park Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Both check valves had a slight audible slam on closure. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
119	Park Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
119	Park Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
119	Park Avenue	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
119	Park Avenue	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
119	Park Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
119	Park Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
119	Park Avenue	Electrical Equipment	Electrical Equipment	3	1	Good Cables Fatigued and Cracked	Continue Scheduled Maintenance Activities	No Comment	2
119	Park Avenue	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
119	Park Avenue	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
119	Park Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
119	Park Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1



Table 119-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
119	Park Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
119	Park Avenue	Transfer Switch	Transfer Switch	3	2	Good No Panel Door Grounding Wire	Continue Scheduled Maintenance Activities	No panel door grounding wire is installed.	2
119	Park Avenue	Engine	Generator Drive Engine	3	1	Leaking Fluids	Continue Scheduled Maintenance Activities	No Comment	2
119	Park Avenue	Generator	Generator	3	1	Good	Continue Scheduled Maintenance Activities	No Comment	2
119	Park Avenue	Batteries and Charger	Batteries and Charger	3	2	None to Report	Continue Scheduled Maintenance Activities	Pedestal has corrosion from electrolyte escaping the cells.	2
119	Park Avenue	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
119	Park Avenue	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

## Draw-Down Testing



### Park Ave Assets of Interest

Pump #2 lost prime during normal operations as observed during inspection. Operations personnel reported reliability issues at the station.



Figure 119-3. Pump No. 2

### Park Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Bubbler control panel is not protected with surge suppression
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not properly bonded to the station grounding system

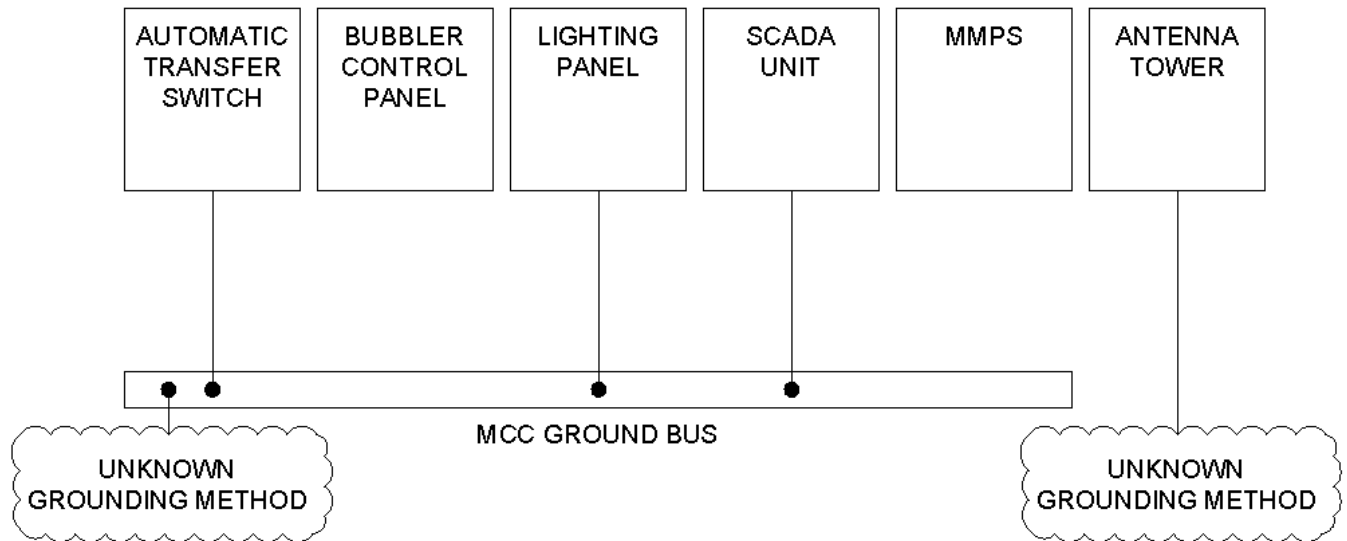


Figure 119-4. Park Ave Grounding System

### Park Ave Lightning Protection Recommendations

- Install a service entrance TYPE 2 surge protection device in accordance with NFPA 70 Article 285
- Install a proper lightning protection system in accordance with NFPA 780 & NFPA 70 Article 250.106
- Install a proper ground ring system around the station in accordance with NFPA 70 Article 250.53
- Replace bulkhead coax fitting on SCADA Unit with a surge suppression type bulkhead fitting
- Bond bubbler control panel & MMPS to the station grounding system in accordance with NFPA 70 Article 250.96
- Install a TYPE 3 surge suppressor in the bubbler control panel in accordance with NFPA 70 Article 285

### Park Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs

- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PRS 120 Pine Tree Pressure Reducing Station

### Pine Tree PRS Facility Description



Figure 120-1. Pine Tree PRS Location Map



Figure 120-2. Pine Tree PRS

<b>Table 120-1. Pine Tree PRS</b>	
<b>Pumping Facility Number</b>	<b>120</b>
<b>Date of Initial Inspection</b>	<b>7/1/2008</b>
<b>Date of Update Inspection</b>	<b>6/23/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/21/2011</b>
<b>Date of Construction</b>	<b>1970</b>
<b>Address</b>	<b>2924 Virginia Beach Blvd, Virginia Beach</b>
<b>Receiving Facility</b>	<b>Atlantic Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>70 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>6800 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>10200 GPM</b>
<b>Number of Pumps</b>	<b>3</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>3400 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>General Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>100</b>
<b>Generator Power (KW)</b>	<b>280</b>

### **Pine Tree Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Pine Tree pressure reducing station was taken out of operation during the 2011 inspections so performance scores were not given. The data presented is based on visual observations of equipment. Any performance related comments for assets without performance scores are from the 2008 inspection data and were not verified due to equipment being tagged out.



Table 120-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
120	Pine Tree	Building	Building	2	1	Good	No Immediate Action Required	5 ton crane. Recently replaced bypass piping.	1
120	Pine Tree	HVAC System	HVAC System	2	2	Good	No Immediate Action Required	Ventilation is short circuiting. The exhaust fan is pulling air backwards through the radiator (shroud inflates). The generator louvers allow air to enter as well while the louvers far from the fan do not open.  No mechanical dry well ventilation.	1
120	Pine Tree	Motor 1	Wastewater Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Station tagged out in 2011.	2
120	Pine Tree	Motor 2	Wastewater Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Station tagged out in 2011.	2
120	Pine Tree	Motor 3	Wastewater Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Station tagged out in 2011.	2
120	Pine Tree	Pump 1	Pump	3	See Comments	Bearing Noise	Continue Scheduled Maintenance Activities	Slight chatter in power box. Observation made during 2008 inspections. Station tagged out in 2011.	2
120	Pine Tree	Pump 2	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Station tagged out in 2011.	2
120	Pine Tree	Pump 3	Pump	4	See Comments	Bearing Noise	Continue Scheduled Maintenance Activities	Pronounced buzz. Observation made during 2008 inspections. Station tagged out in 2011. Check valve open - shaft not spinning.	2
120	Pine Tree	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

**Table 120-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
120	Pine Tree	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Recently installed HDPE bypass piping. 2 - 16" isolation valves with 1 16" check valve. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
120	Pine Tree	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
120	Pine Tree	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No panel door ground wire is installed on the VFD.	1
120	Pine Tree	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
120	Pine Tree	Control Panel	Control Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1

**Table 120-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
120	Pine Tree	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
120	Pine Tree	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
120	Pine Tree	SCADA	SCADA	2	1	None to Report	No Immediate Action Required	No Comment	1
120	Pine Tree	Velocity Profiler	Velocity Profiler	1	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
120	Pine Tree	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
120	Pine Tree	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Radiator shroud inflates as air is pulled backward through radiator by HVAC exhaust fan.	1
120	Pine Tree	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
120	Pine Tree	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Exposed battery terminals.	1
120	Pine Tree	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
120	Pine Tree	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Drawdown Testing

Not applicable.

### Pine Tree Assets of Interest

None.

#### Pine Tree Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Control panel & velocity profiler are not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system

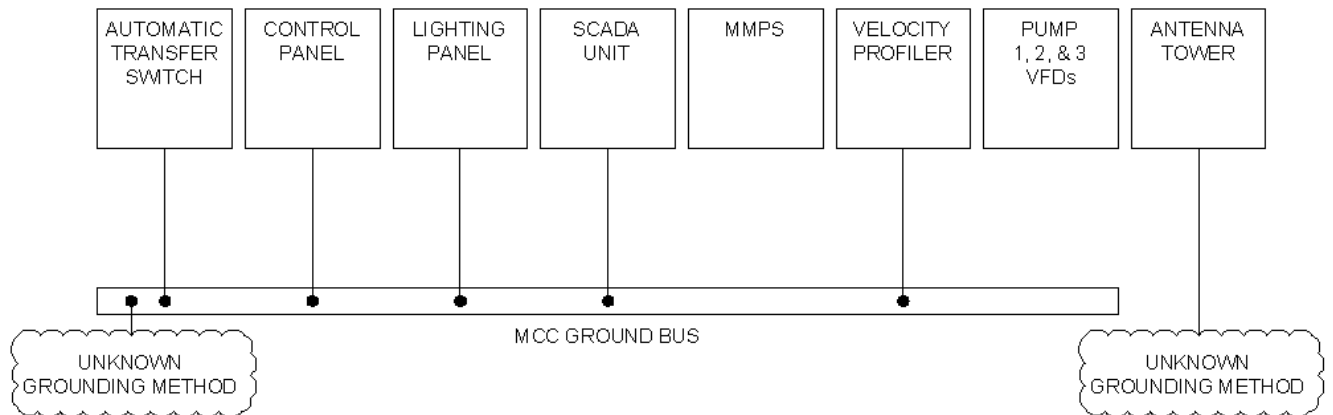


Figure 120-3. Pine Tree Grounding System

#### Pine Tree Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment

- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 121 Plume St Pump Station

### Plume St Facility Description



Figure 121-1. Plume St PS Location Map



Figure 121-2. Plume St PS

<b>Table 121-1. Plume St PS</b>	
<b>Pumping Facility Number</b>	<b>121</b>
<b>Date of Initial Inspection</b>	<b>6/23/2008</b>
<b>Date of Update Inspection</b>	<b>6/20/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/18/2011</b>
<b>Date of Construction</b>	<b>1956</b>
<b>Address</b>	<b>236 E. Plume Street, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>50 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>8680 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>14240 GPM</b>
<b>Number of Pumps</b>	<b>4</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>1740 GPM, 2780 GPM, 4160 GPM, 5560 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Motor Nameplate Power (HP)</b>	<b>40, 50, 75, 100</b>
<b>Generator Power (KW)</b>	<b>None</b>

### Plume St Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



Table 121-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
121	Plume Street	Building	Building	2	1	Good	No Immediate Action Required	Exterior stairs have rust/corrosion. 7 ton crane.	1
121	Plume Street	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Natural gas burning type of odor control.	1
121	Plume Street	Wet well	Wet well	3	2	Needs Cleaning	Continue Scheduled Maintenance Activities	Sand buildup. Catwalk instead of intermediate deck - in good condition. 6/2011: HRSD PM inspection on 9/16/2011 indicates no major changes from the 2008 wet well data.	2
121	Plume Street	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
121	Plume Street	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	Motor makes noise	1
121	Plume Street	Motor 2	Motor and Controller	3	1	Makes Noise Vibrates	Continue Scheduled Maintenance Activities	Visible vibration. No name plate info to verify on motor. Noise is related to shaft rotation.	2
121	Plume Street	Motor 3	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
121	Plume Street	Motor 4	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
121	Plume Street	Pump 1	Pump	3	2	Vibrating	Continue Scheduled Maintenance Activities	Pump mount corrosion. Stuffing box slings water.	2
121	Plume Street	Pump 2	Pump	3	1	None to Report	Continue Scheduled Maintenance Activities	The stuffing box is dripping and corroding the base.	2
121	Plume Street	Pump 3	Pump	2	2	Good	No Immediate Action Required	Pump makes noise.	1
121	Plume Street	Pump 4	Pump	2	3	Good	Continue Scheduled Maintenance Activities	Pump made noises.	2
121	Plume Street	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

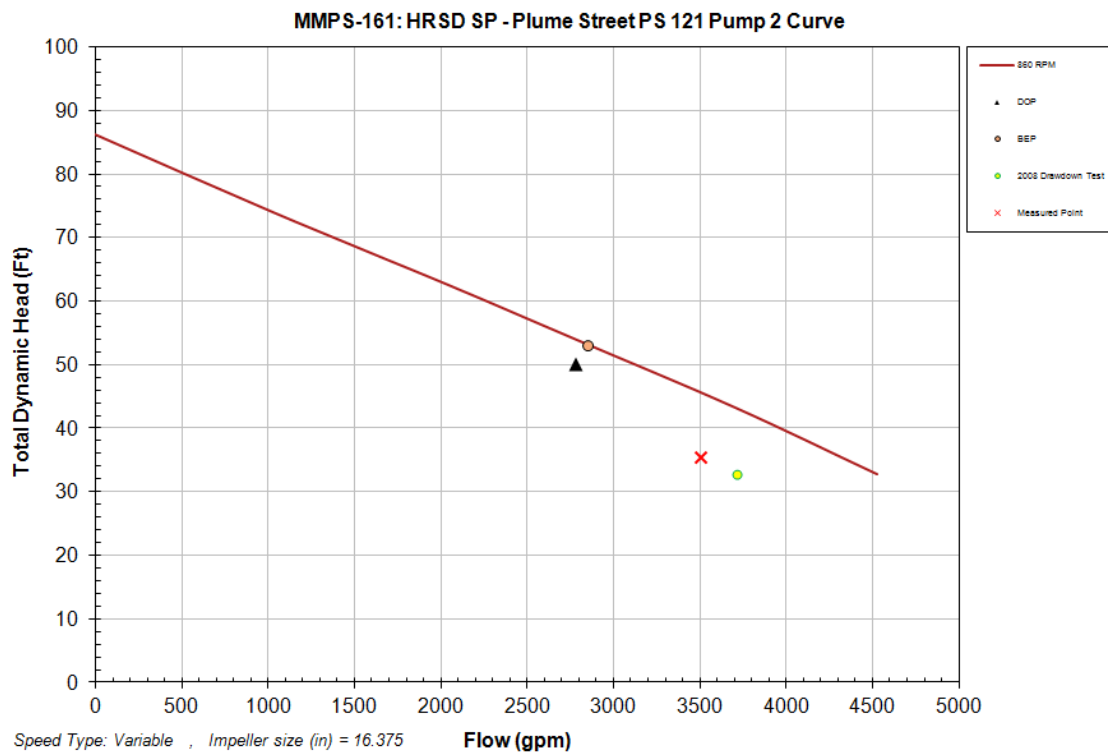
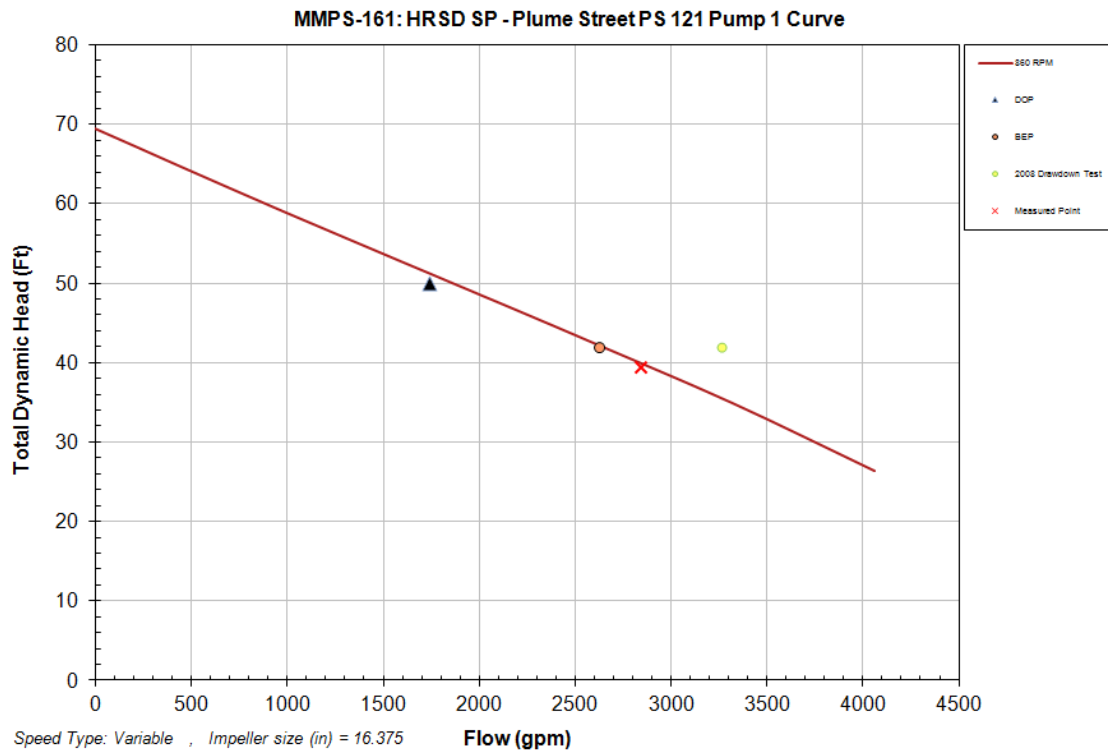
**Table 121-2. Pumping Facility Asset Condition and Performance Ratings**

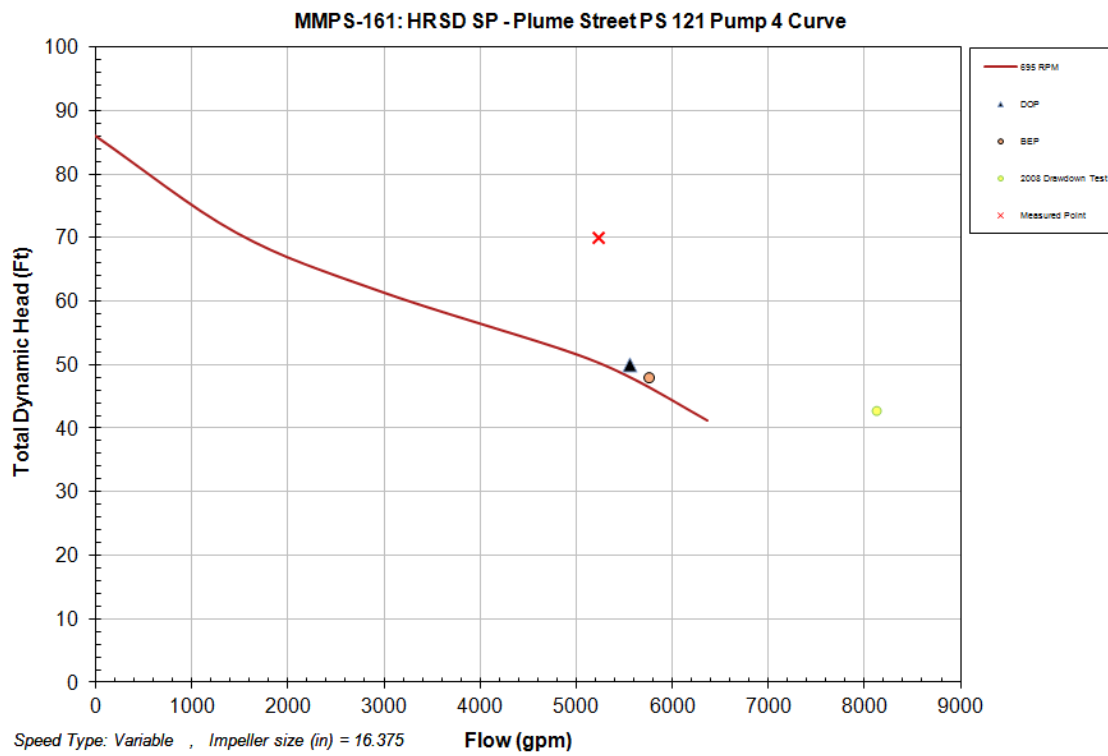
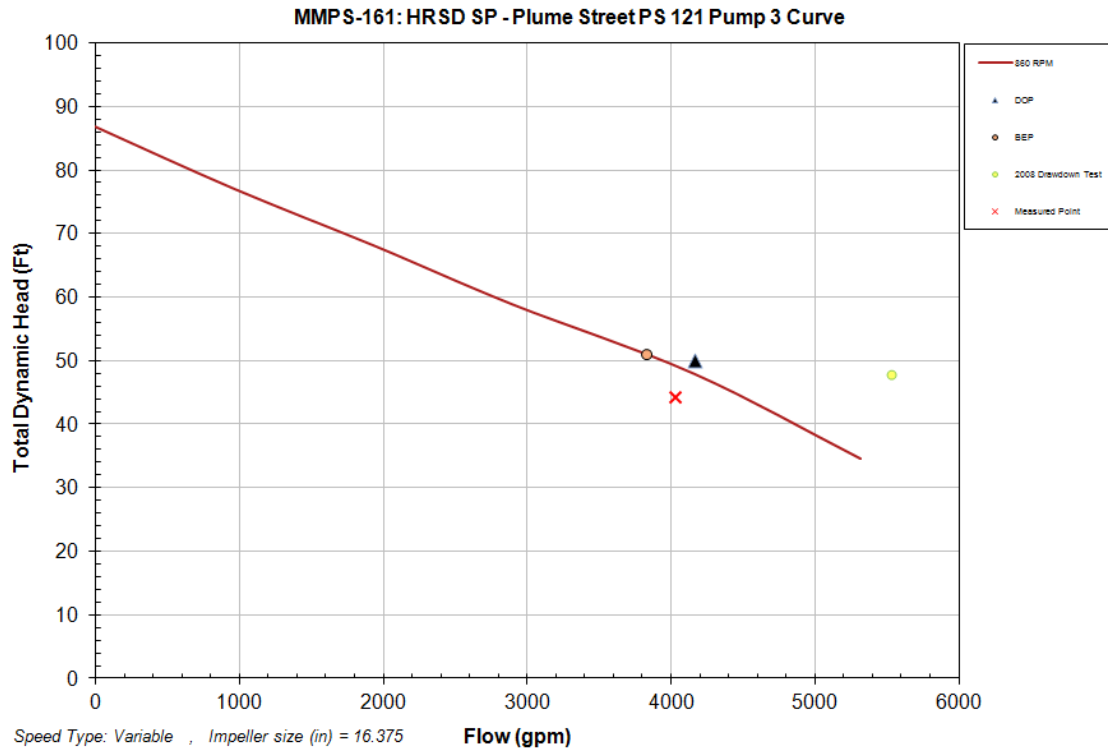
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
121	Plume Street	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Some corrosion at flanges and joints for discharge valves. Suction valves: #1=8"; #2=12", #3&#4=14". Discharge and Check valves: #1=10", #2=14", #3&#4=18". 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
121	Plume Street	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Check Valve Pump 4	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 121-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
121	Plume Street	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
121	Plume Street	Electrical Equipment	Electrical Equipment	3	2	Panel Corroded Panel Obsolete Bare Wires	Continue Scheduled Maintenance Activities	2 stage start panel on #3 is obsolete technology. No automatic back up power source. Panels do not have a door grounding wire installed.	2
121	Plume Street	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
121	Plume Street	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
121	Plume Street	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
121	Plume Street	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
121	Plume Street	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1
121	Plume Street	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
121	Plume Street	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Manual throw	1

## Draw-Down Testing





### Plume St Assets of Interest

None.

#### Plume St Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel are not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS, SCADA Unit, & bubbler control panel are not bonded to the station grounding system

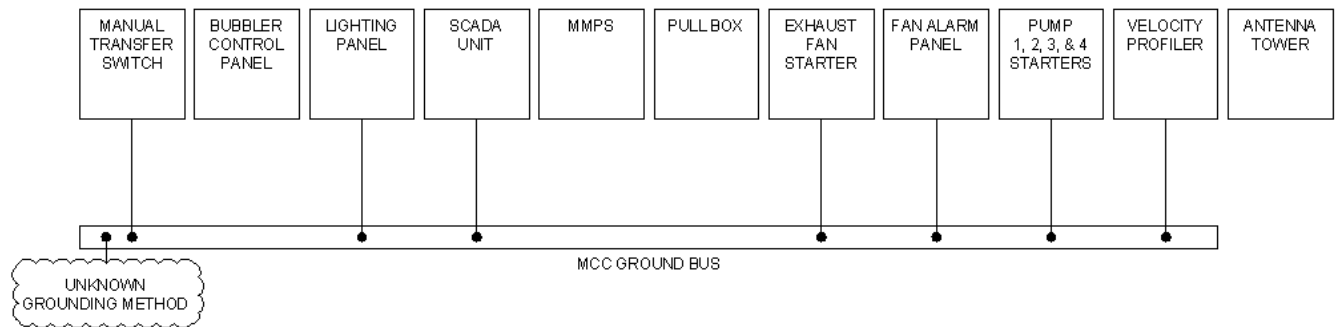


Figure 121-3. Plume St Grounding System

#### Plume St Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded

- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - No automatic back up power source

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## PS 122 Powhatan Ave Pump Station

### Powhatan Ave Facility Description



Figure 122-1. Powhatan Ave PS Location Map



Figure 122-2. Powhatan Ave PS

<b>Table 122-1. Powhatan Ave PS</b>	
<b>Pumping Facility Number</b>	<b>122</b>
<b>Date of Initial Inspection</b>	<b>6/23/2008</b>
<b>Date of Update Inspection</b>	<b>6/21/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/24/2011</b>
<b>Date of Construction</b>	<b>1948</b>
<b>Address</b>	<b>1548 Buckingham Avenue, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>39 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>800 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>1600 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>800 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>General Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>15</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Powhatan Ave Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

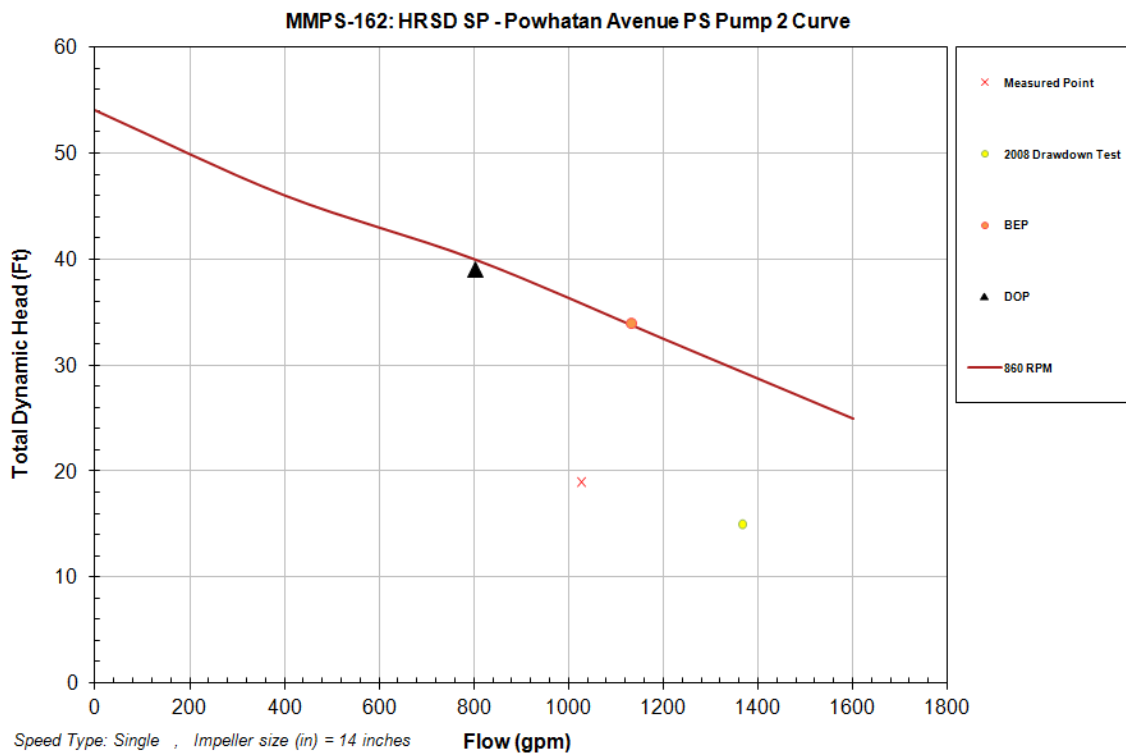
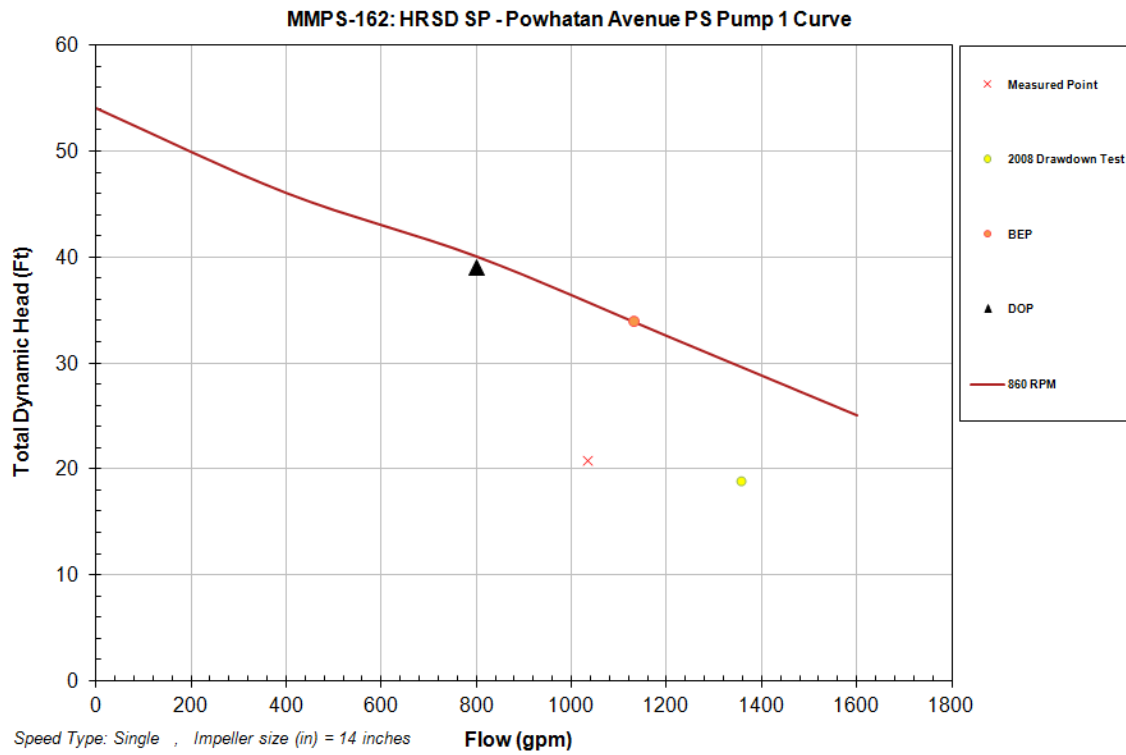
Table 122-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
122	Powhatan Avenue	Building	Building	2	1	Good	No Immediate Action Required	Building has slate roof. 3600 lb crane rail.	1
122	Powhatan Avenue	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation weak. Motor room has passive ventilation only.	1
122	Powhatan Avenue	Wet well	Wet well	1	1	Good	No Immediate Action Required	Wet well was rehabilitated in 2008. 5/2012: HRSD PM inspection on 02/02/2012 indicates no major changes from the 2008 wet well data.	1
122	Powhatan Avenue	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	Pump 1	Pump	3	2	None to Report	Continue Scheduled Maintenance Activities	Slapping noise on startup and shutdown. Flow meter: 4.8 fps, 1200 gpm. Station has short run times.	2
122	Powhatan Avenue	Pump 2	Pump	3	2	None to Report	Continue Scheduled Maintenance Activities	Slapping noise on startup. Flow meter: 4.8 fps, 1170 gpm. Station has short run times.	2
122	Powhatan Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	Valves System	All Station Valves	2	1	None to Report	No Immediate Action Required	Lead joints prone to problems. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
122	Powhatan Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
122	Powhatan Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
122	Powhatan Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 122-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
122	Powhatan Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
122	Powhatan Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
122	Powhatan Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
122	Powhatan Avenue	Electrical Equipment	Electrical Equipment	2	1	Good Dust Inside Panel	No Immediate Action Required	No automatic back up power source.	1
122	Powhatan Avenue	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
122	Powhatan Avenue	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
122	Powhatan Avenue	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1

### Draw-Down Testing



### Powhatan Ave Assets of Interest

None.

### Powhatan Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system.
  - Broken antenna ground wire outside of pump station.

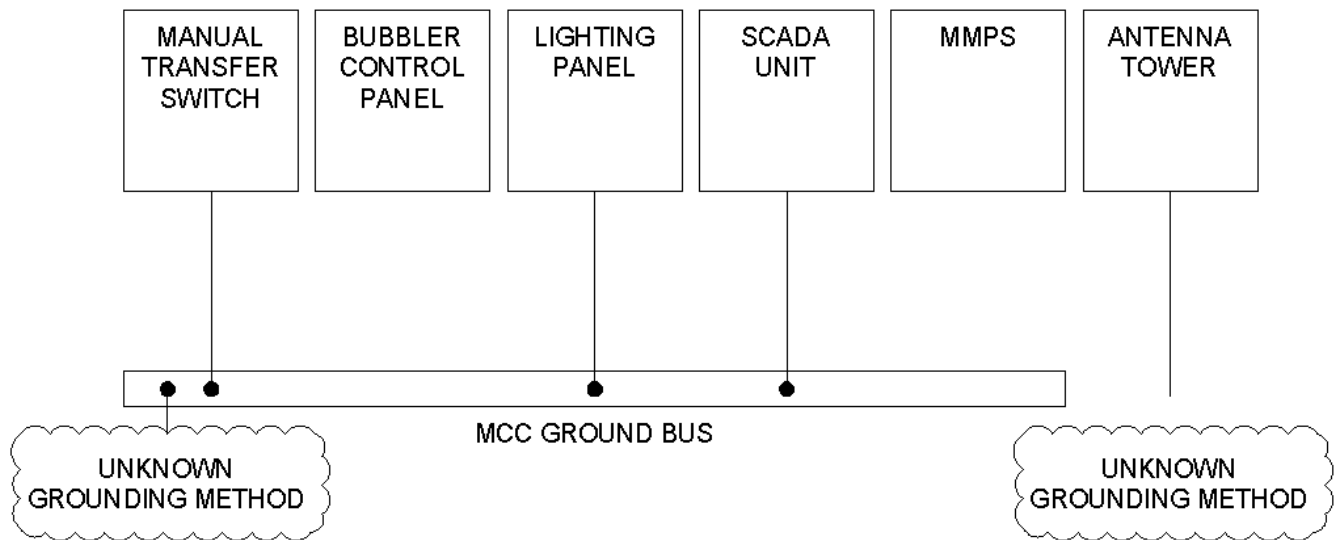


Figure 122-4. Powhatan Ave Grounding System

### Powhatan Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)

- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

– No automatic back up power source

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## PS 123 Quail Ave Pump Station

### Quail Ave Facility Description

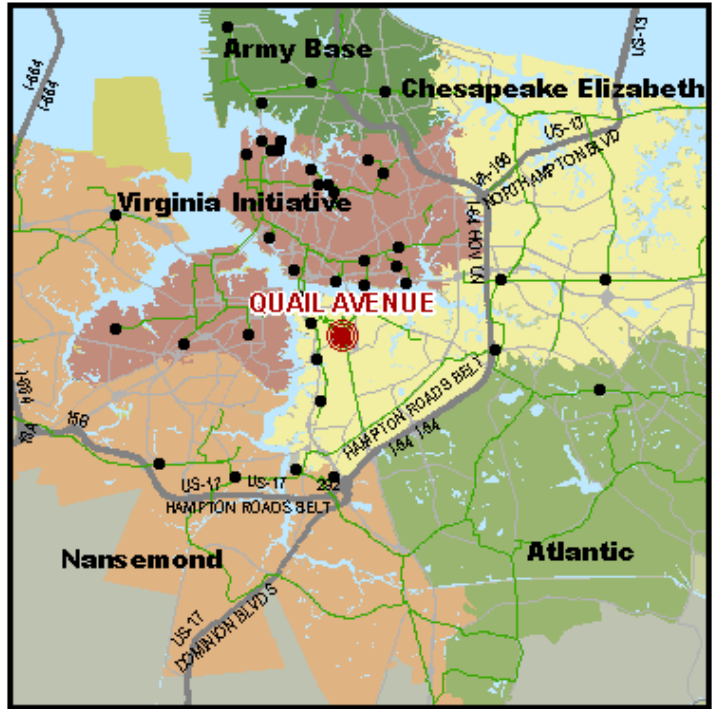


Figure 123-1. Quail Ave PS Location Map



Figure 123-2. Quail Ave PS

<b>Table 123-1. Quail Ave PS</b>	
<b>Pumping Facility Number</b>	123
<b>Date of Initial Inspection</b>	6/25/2008
<b>Date of Update Inspection</b>	6/20/2011
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	7/20/2011
<b>Date of Construction</b>	1958
<b>Address</b>	800 Quail Avenue, Chesapeake
<b>Receiving Facility</b>	Atlantic Treatment Plant
<b>Design Head (Feet)</b>	39 ft.
<b>Firm Pumping Capacity (GPM)</b>	2300 GPM
<b>Total Pumping Capacity (GPM)</b>	4600 GPM
<b>Number of Pumps</b>	2
<b>Pump Type</b>	Centrifugal
<b>Pump Manufacturer</b>	Fairbanks Morse
<b>Pump Nameplate Capacity</b>	2300 GPM
<b>Standby Pump(s) present during inspection</b>	None
<b>Motor Manufacturer</b>	Fairbanks Morse
<b>Motor Nameplate Power (HP)</b>	25
<b>Generator Power (KW)</b>	None

### Quail Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 123-2. Pumping Facility Asset Condition and Performance Ratings**

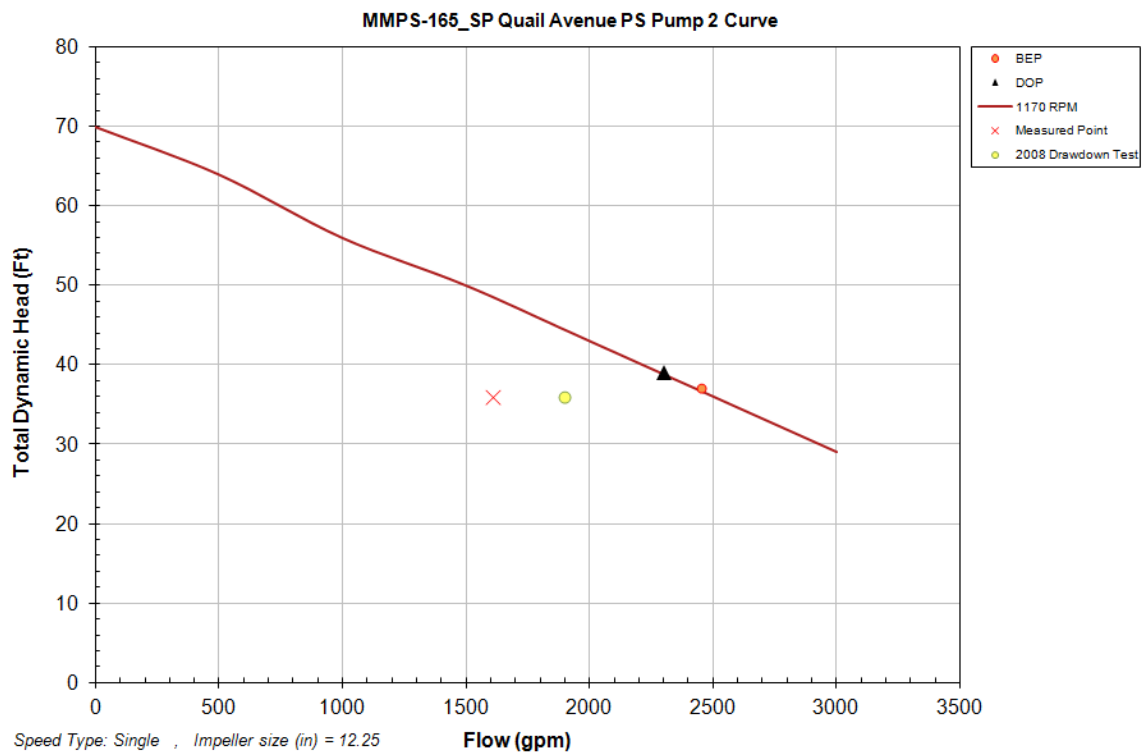
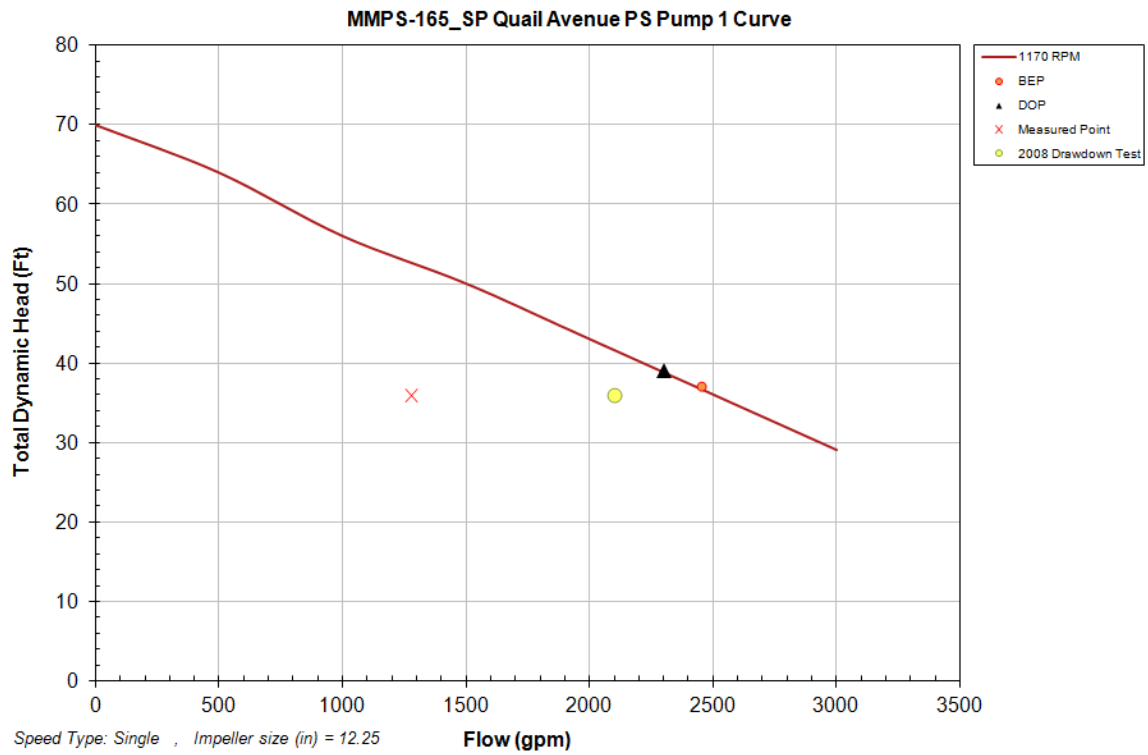
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
123	Quail Avenue	Building	Building	2	1	Good	No Immediate Action Required	Old windows do not work well.	1
123	Quail Avenue	HVAC System	HVAC System	2	1	Good Low Detectable Airflow	No Immediate Action Required	1/6 HP Blower. Dry well ventilation weak. Exhaust fan 2 not found. Motor room has passive ventilation only. 5 ton crane rail.	1
123	Quail Avenue	Wet well	Wet well	3	3	Good	Continue Scheduled Maintenance Activities	Intermediate deck rehabbed. Wet well gets heavy grease and sand. Bar screen at station requires frequent deragging 5/2012: HRSD PM inspection on 03/08/2012 indicates no major changes from the 2008 wet well data.	2
123	Quail Avenue	Influent Valve	Influent Valve	1	1	None to Report	No Immediate Action Required	No Comment	1
123	Quail Avenue	Motor 1	Motor and Controller	2	1	Good Makes Noise	No Immediate Action Required	There is a rattle noise at the lower end possibly coming from the shaft cage.	1
123	Quail Avenue	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
123	Quail Avenue	Pump 1	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Impeller diameter and discharge could not be verified. Shaft deflection is on the intermediate level - produces a noise. Pumps have short run time of around 1 minute and cycle often.	1
123	Quail Avenue	Pump 2	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Pump made noises. Shaft deflection is likely the cause of pump vibration. Pumps have short run time of around 1 minute and cycle often.	2
123	Quail Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

Table 123-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
123	Quail Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valves slam audibly on closure. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
123	Quail Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
123	Quail Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
123	Quail Avenue	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
123	Quail Avenue	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
123	Quail Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
123	Quail Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
123	Quail Avenue	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	Emergency power from Quail PRS genset.	1
123	Quail Avenue	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
123	Quail Avenue	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed. Indications of a fire inside of the panel.	Continue Scheduled Maintenance Activities	No Comment	2
123	Quail Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
123	Quail Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

Table 123-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
123	Quail Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1

## Draw-Down Testing



### Quail Ave Assets of Interest

None.

### Quail Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS, SCADA unit, & bubbler control panel are not bonded to the station grounding system

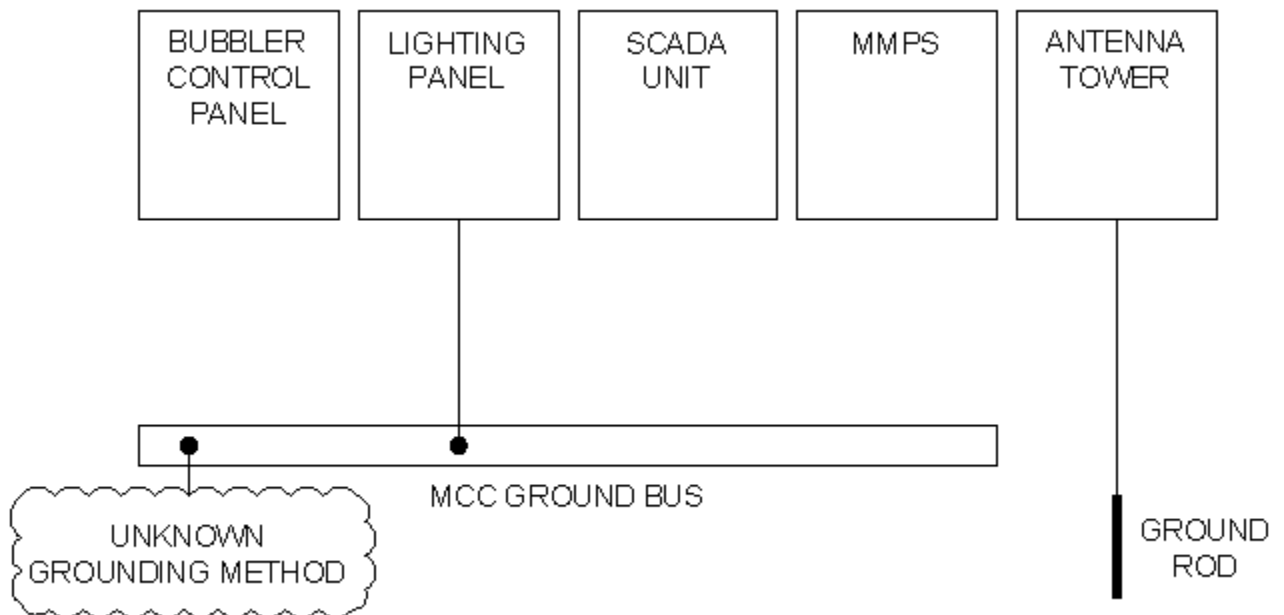


Figure 123-3. Quail Ave PS Grounding System

### Quail Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked

- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other



# PS 124 Richmond Crescent Pump Station

## Richmond Crescent Facility Description



Figure 124-1. Richmond Crescent PS Location Map



Figure 124-2. Richmond Crescent PS

<b>Table 124-1. Richmond Crescent PS</b>	
<b>Pumping Facility Number</b>	124
<b>Date of Initial Inspection</b>	6/23/2008
<b>Date of Update Inspection</b>	6/21/2011
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	6/24/2011
<b>Date of Construction</b>	1948
<b>Address</b>	128 Richmond Crescent, Norfolk
<b>Receiving Facility</b>	Virginia Initiative Treatment Plant
<b>Design Head (Feet)</b>	26
<b>Firm Pumping Capacity (GPM)</b>	600
<b>Total Pumping Capacity (GPM)</b>	1200
<b>Number of Pumps</b>	2
<b>Pump Type</b>	Dry-pit Submersible
<b>Pump Manufacturer</b>	Fairbanks Morse
<b>Pump Nameplate Capacity</b>	600 GPM
<b>Standby Pump(s) present during inspection</b>	6" Godwin CD150M
<b>Motor Manufacturer</b>	Fairbanks Morse
<b>Motor Nameplate Power (HP)</b>	10
<b>Generator Power (KW)</b>	None

### Richmond Crescent Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 124-2. Pumping Facility Asset Condition and Performance Ratings

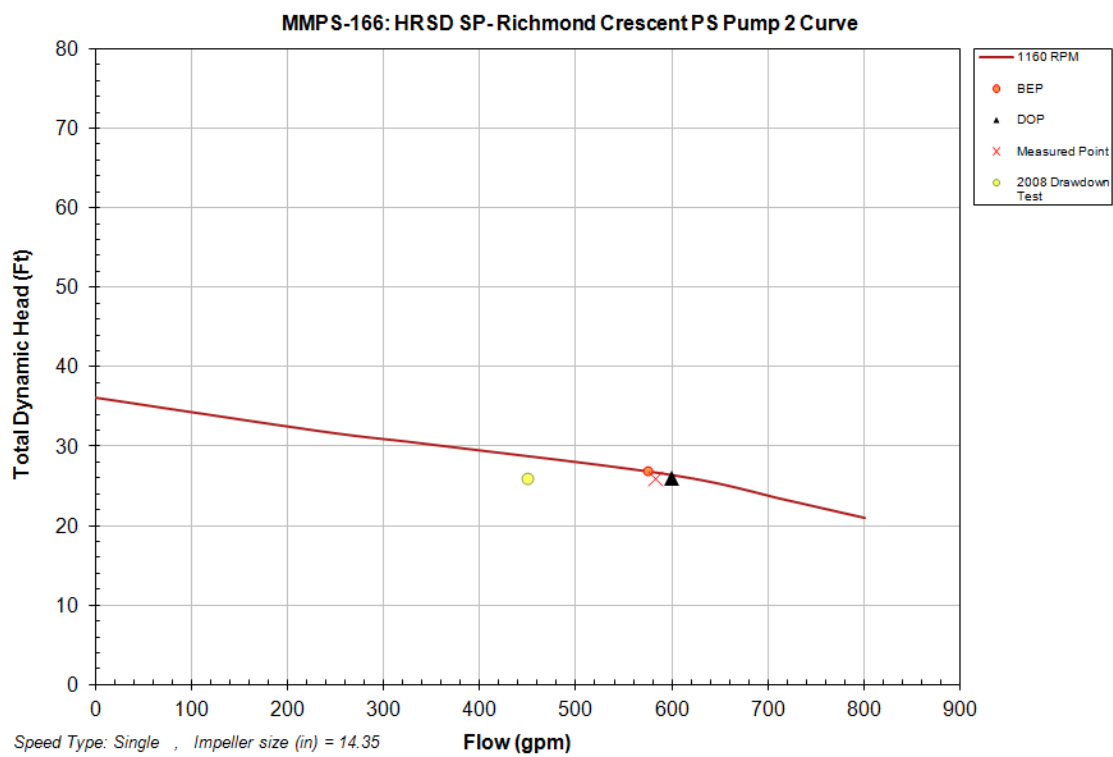
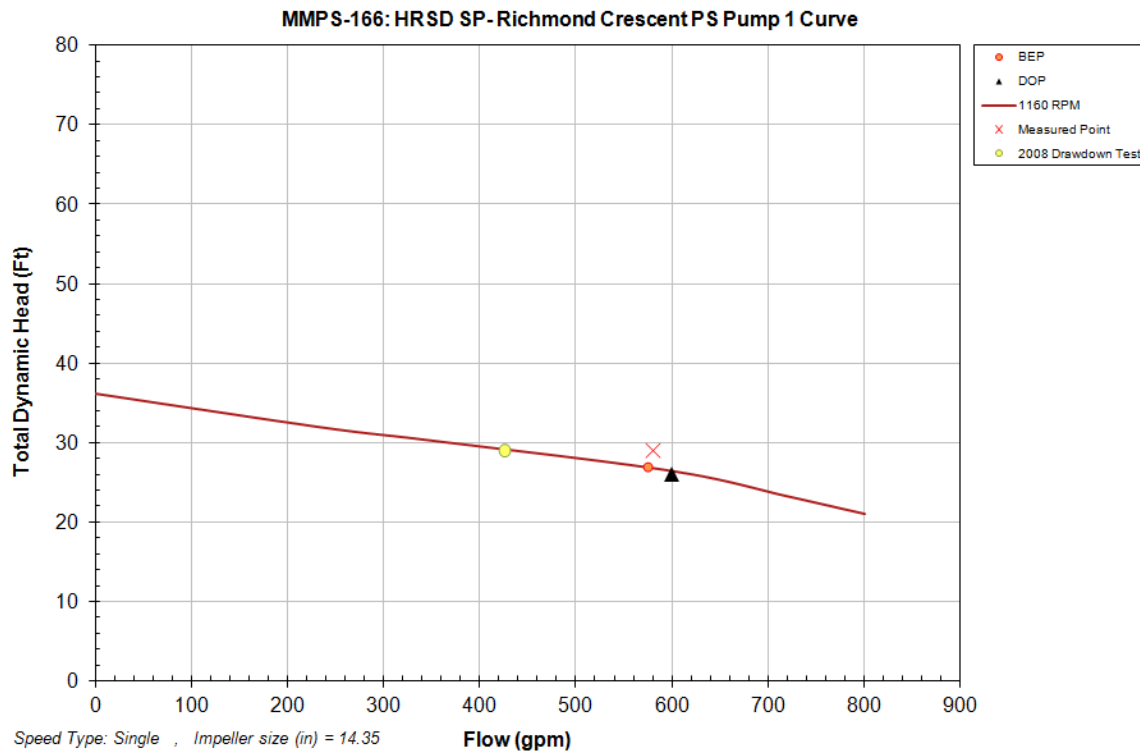
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
124	Richmond Crescent	Building	Building	2	1	Good	No Immediate Action Required	Godwin pump (D62042) is raised up for flood protection.	1
124	Richmond Crescent	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Ventilation Fan: 1/3 HP, 1725 RPM, 115/230 VAC. Exhaust fan is weak.	1
124	Richmond Crescent	Wet well	Wet well	2	2	Concrete Spalling	Continue Scheduled Maintenance Activities	Spalling in lower/ mid part of wet well and some appurtenances. Upper well in good condition. 5/2012: HRSD PM inspection on 03/02/2012 indicates no major changes from the 2008 wet well data.	2
124	Richmond Crescent	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
124	Richmond Crescent	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	Replaced after November 2009 Nor'easter	1
124	Richmond Crescent	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	Replaced after November 2009 Nor'easter	1
124	Richmond Crescent	Pump 1	Pump	2	1	Good	No Immediate Action Required	No Comment	1
124	Richmond Crescent	Pump 2	Pump	2	1	Good	No Immediate Action Required	No nameplate on the pump	1
124	Richmond Crescent	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
124	Richmond Crescent	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
124	Richmond Crescent	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
124	Richmond Crescent	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 124-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
124	Richmond Crescent	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
124	Richmond Crescent	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
124	Richmond Crescent	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
124	Richmond Crescent	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
124	Richmond Crescent	Electrical Equipment	Electrical Equipment	2	1	Good Panel Corroded	No Immediate Action Required	Conduit entrances do not maintain the NEMA rating of the panels.	1
124	Richmond Crescent	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
124	Richmond Crescent	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
124	Richmond Crescent	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
124	Richmond Crescent	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
124	Richmond Crescent	SCADA	SCADA	4	2	No panel door grounding wire Terminal strip not labeled Uncapped wires loose in the panel Corrosion	Schedule Corrective Action	Panel is corroded. Replace corroded panel.	3
124	Richmond Crescent	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
124	Richmond Crescent	Engine	Generator Drive Engine	2	2	Good	No Immediate Action Required	Temperature Gauge not reading properly.	1

Table 124-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
124	Richmond Crescent	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
124	Richmond Crescent	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
124	Richmond Crescent	Tank 1	Fuel Tank	2	1	Good	No Immediate Action Required	Belly Tank	1

## Draw-Down Testing



Richmond Crescent PS does not have a discharge pressure sensor with remote indication. The station does not discharge to a manifolded force main so the TDH was assumed based on the results of the 2008 draw down test. The Flow is the average pumping rate.

### Richmond Crescent Assets of Interest

The SCADA panel is a C&P Region 3 asset because of corrosion.

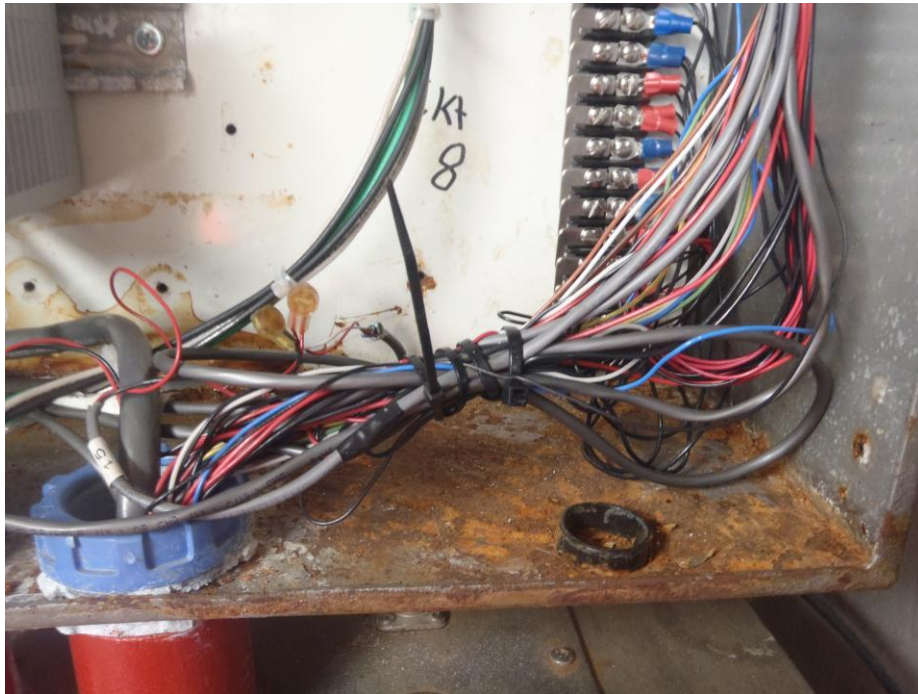


Figure 124-3. SCADA Panel

### Richmond Crescent Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment Properly Grounded:
  - Generator pull box & MMPS are not bonded to the station grounding system.



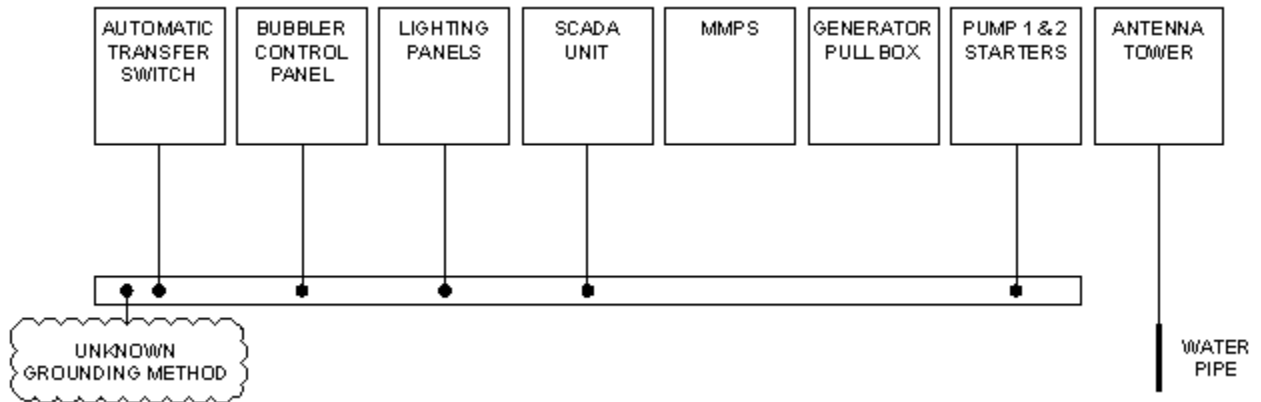


Figure 124-4. Richmond Crescent Grounding System

**Richmond Crescent Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other



## PS 125 Seay Ave Pump Station

### Seay Ave Facility Description



Figure 125-1. Seay Ave PS Location Map



Figure 125-2. Seay Ave PS

<b>Table 125-1. Seay Ave PS</b>	
<b>Pumping Facility Number</b>	<b>125</b>
<b>Date of Initial Inspection</b>	<b>6/25/2008</b>
<b>Date of Update Inspection</b>	<b>6/20/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/22/2011</b>
<b>Date of Construction</b>	<b>1952</b>
<b>Address</b>	<b>3541 Seay Avenue, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>43 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>1000 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>2000 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>1000 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>6" Godwin CD150M</b>
<b>Motor Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Motor Nameplate Power (HP)</b>	<b>15</b>
<b>Generator Power (KW)</b>	<b>None</b>

### Seay Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 125-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
125	Seay Avenue	Building	Building	3	1	None to Report	Continue Scheduled Maintenance Activities	Moderate corrosion at influent wall penetration. There is a weep at the discharge pipe. Station has slate roof. Godwin D-62452 onsite.	2
125	Seay Avenue	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	HVAC blower: 1/6 HP. Dry well ventilation weak.	1
125	Seay Avenue	Wet well	Wet well	3	2	Concrete Spalling	Continue Scheduled Maintenance Activities	Isolated spalling on intermediate deck and influent channel. 5/2012: HRSD PM inspection on 03/06/2012 indicates no major changes from the 2008 wet well data.	2
125	Seay Avenue	Influent Valve	Influent Valve	4	2	None to Report	Schedule Corrective Action	Leakage	3
125	Seay Avenue	Motor 1	Motor and Controller	2	1	Opposite End Bearing Noise	No Immediate Action Required	No Comment	1
125	Seay Avenue	Motor 2	Motor and Controller	2	1	Good Makes Noise	No Immediate Action Required	Makes a clicking sound as it winds down.	1
125	Seay Avenue	Pump 1	Pump	3	3	Shaft Deflection	Continue Scheduled Maintenance Activities	Slight visible oscillation in shaft. Pump lost prime during normal ops but regained within the wet well operating levels. Operating conditions: 610 gpm, 6.4 fps. Pump had noise in the top end.	2
125	Seay Avenue	Pump 2	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Operating conditions: 610 gpm, 6.4 fps. Static pressure: 3 psi. Operating: 19 psi. Station can operate with pumps in parallel or series. Ops reports series pumping is only for rain events.	1

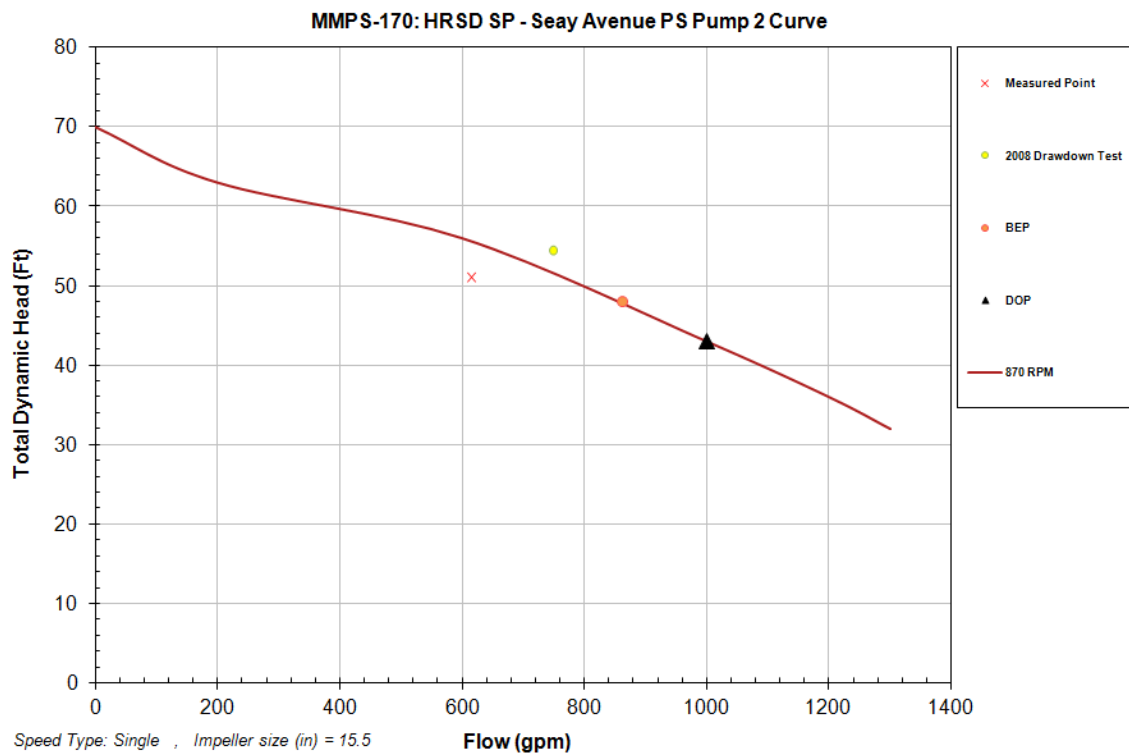
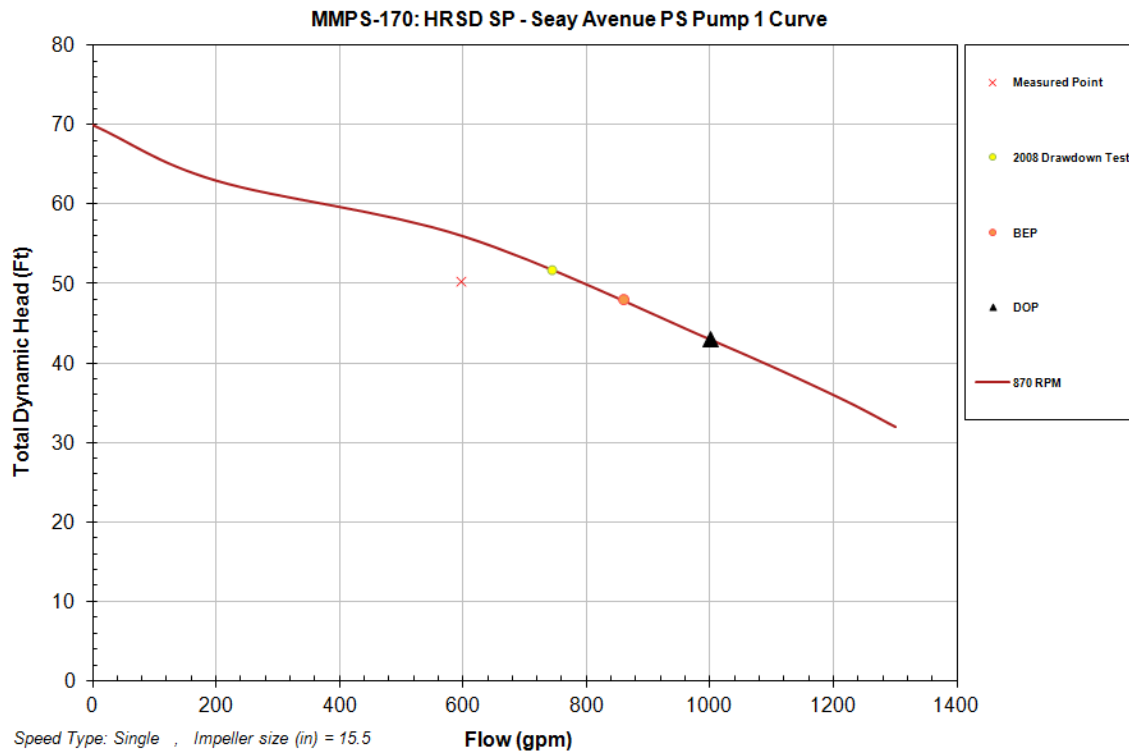
Table 125-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
125	Seay Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
125	Seay Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
125	Seay Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
125	Seay Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
125	Seay Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
125	Seay Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
125	Seay Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
125	Seay Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
125	Seay Avenue	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No automatic back up power source. Breaker in MCC may have a bad LOTO.	1
125	Seay Avenue	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
125	Seay Avenue	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed. Indications of a fire inside of the panel.	No Immediate Action Required	No Comment	1

**Table 125-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
125	Seay Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
125	Seay Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
125	Seay Avenue	SCADA	SCADA	2	1	No panel door grounding wire is installed. Uncapped wires loose in the panel. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
125	Seay Avenue	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1

### Draw-Down Testing



### Seay Ave Assets of Interest

None.

### Seay Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment Properly Grounded:
  - Bubbler control panel is not bonded to the station grounding system.

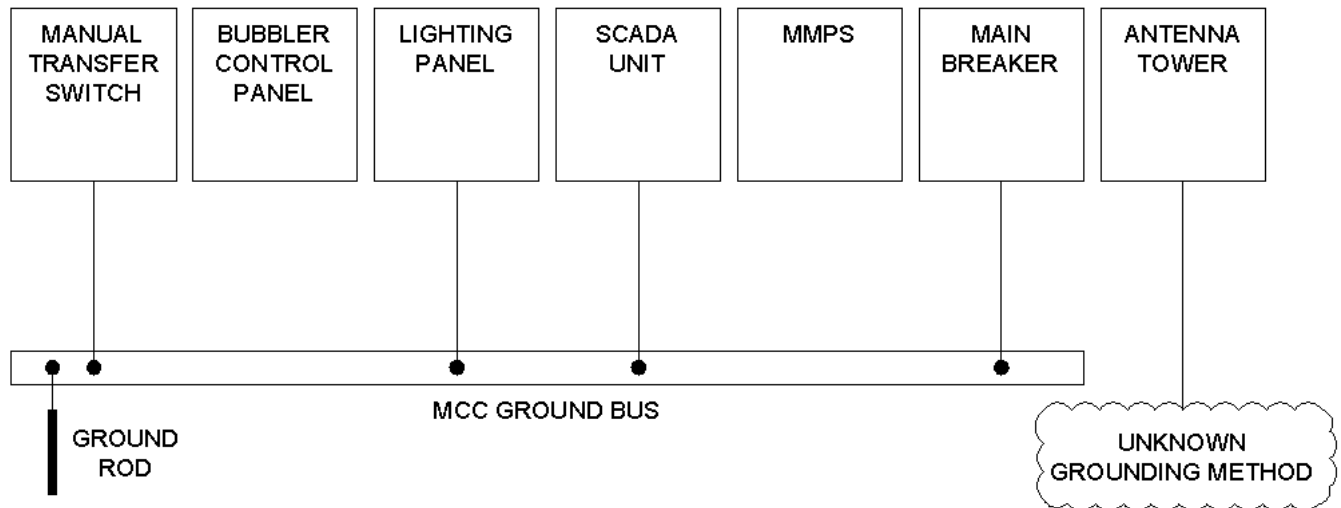


Figure 125-3. Seay Ave Grounding System

### Seay Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions

- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - No automatic back up power source



## PS 127 State St. Pump Station

### State St Facility Description



Figure 127-1. State St PS Location Map



Figure 127-2. State St PS

<b>Table 127-1. State St PS</b>	
<b>Pumping Facility Number</b>	<b>127</b>
<b>Date of Initial Inspection</b>	<b>6/26/2008</b>
<b>Date of Update Inspection</b>	<b>6/10/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/18/2011</b>
<b>Date of Construction</b>	<b>1982</b>
<b>Address</b>	<b>351 Emmett Place, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>65 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>8400 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>12600 GPM</b>
<b>Number of Pumps</b>	<b>3</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Worthington</b>
<b>Pump Nameplate Capacity</b>	<b>4200 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>8" Godwin CD225M</b>
<b>Motor Manufacturer</b>	<b>Continental Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>100</b>
<b>Generator Power (KW)</b>	<b>175</b>

### **State St Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

**Table 127-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
127	State Street	Building	Building	2	1	Good	No Immediate Action Required	2011: Columns have horizontal hairline cracks in the concrete. Crane is 4 tons and in good condition. There is a Godwin pump onsite.	1
127	State Street	HVAC System	HVAC System	3	2	Good Ventilation Inoperable Duct Work Corroded Low Detectable Airflow	Continue Scheduled Maintenance Activities	Scrubber removed. Ozone generator onsite. Red fan in the ozone generator room is not functioning. Dry well ventilation is weak. There is evidence of leakage from the roof around the wet well duct. Duct corrosion on wet well ventilation is not severe.	2
127	State Street	Wet well	Wet well	2	1	Good	No Immediate Action Required	Heavy hydrogen sulfide while operating with sluice open. Only spalling is at typical water surface interface levels (minor). Rest of walls in good condition. Not enough to affect overall rating at this time. 6/2011: HRSD inspections - no changes	1
127	State Street	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
127	State Street	Motor 1	Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Motor #1. 2011: Could not verify because check valve was removed.	2
127	State Street	Motor 2	Motor and Controller	3	1	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Motor #2.	2
127	State Street	Motor 3	Motor and Controller	3	1	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Motor #3.	2

Table 127-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
127	State Street	Pump 1	Pump	2	See Comments	Good Vibrating	Continue Scheduled Maintenance Activities	Pump #1 - Worthington pump, 2008 inspectors observed vibration could be attributed to drive shafts. Could not verify operation due to check valve being removed.	2
127	State Street	Pump 2	Pump	2	3	Vibrating	Continue Scheduled Maintenance Activities	Pump #2 - Worthington pump, vibration could be attributed to drive shafts. While onsite, the pump sounded very loud and rough. Ops later found that the nut holding the impeller had come loose and corrected the issue.	2
127	State Street	Pump 3	Pump	2	2	Good Vibrating	No Immediate Action Required	Pump #3 - Worthington pump, vibration could be attributed to drive shafts.	1
127	State Street	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valve 2 slams closed. Check valve 1 removed during this inspection. 6/11: HRSD inspections - Operation good.	1
127	State Street	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
127	State Street	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
127	State Street	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
127	State Street	Check Valve Pump 1	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
127	State Street	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
127	State Street	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

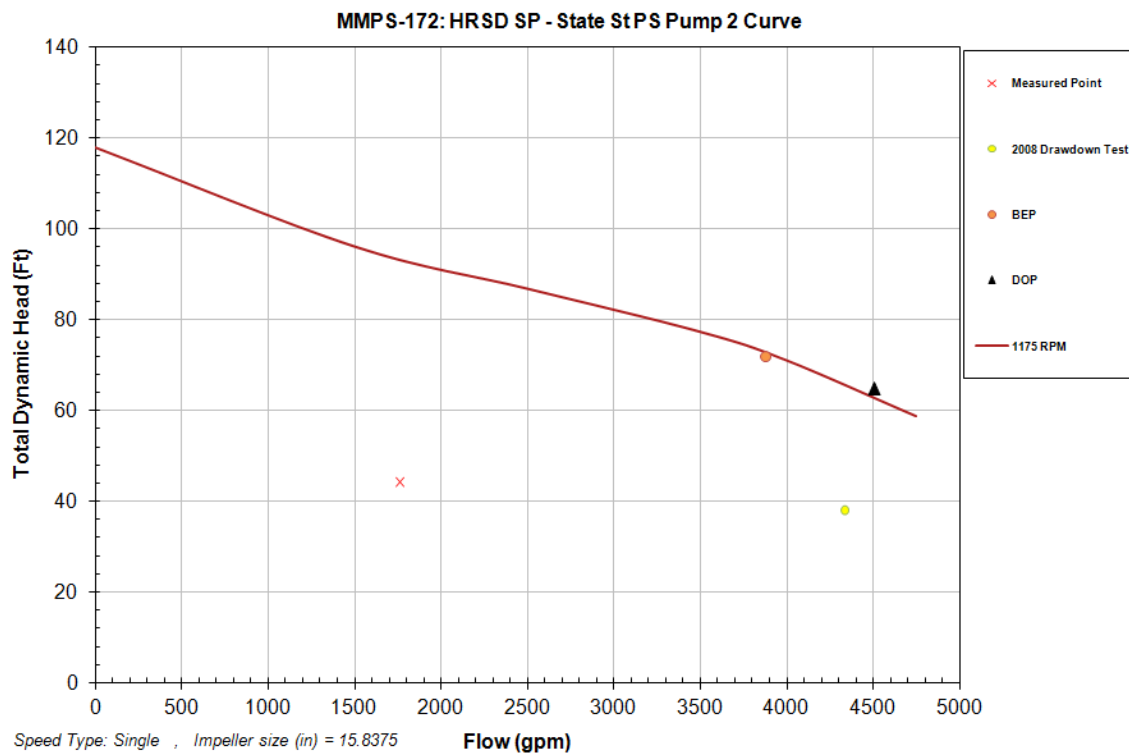
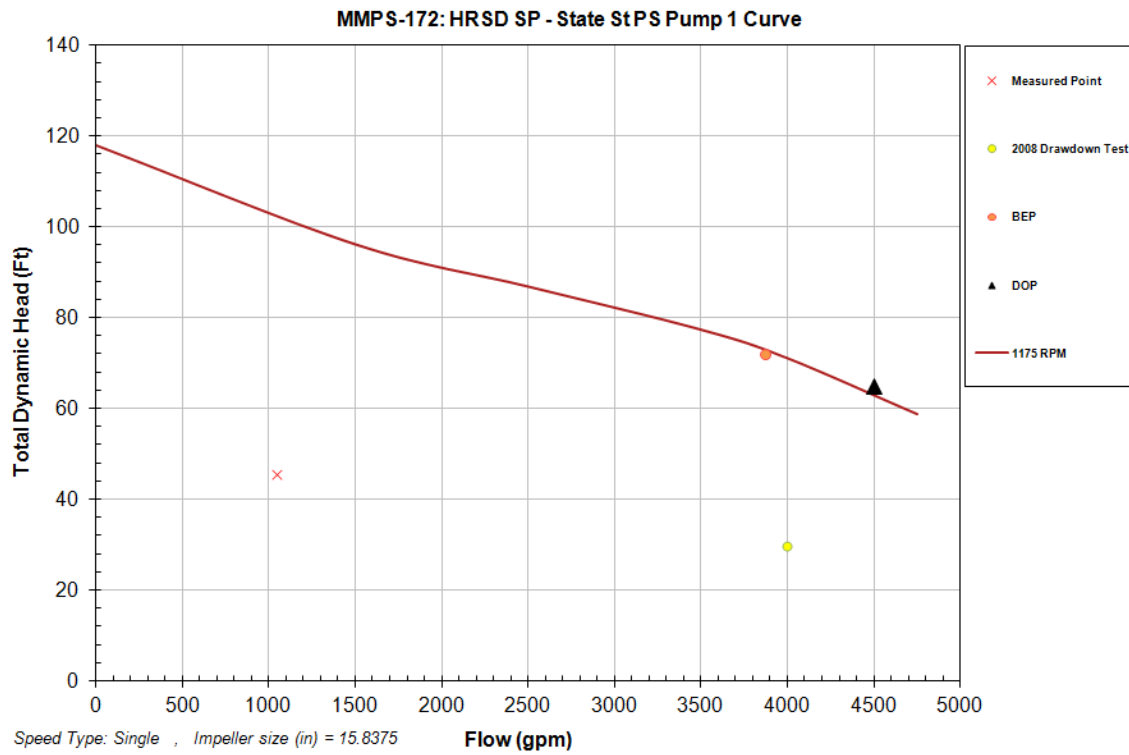
**Table 127-2. Pumping Facility Asset Condition and Performance Ratings**

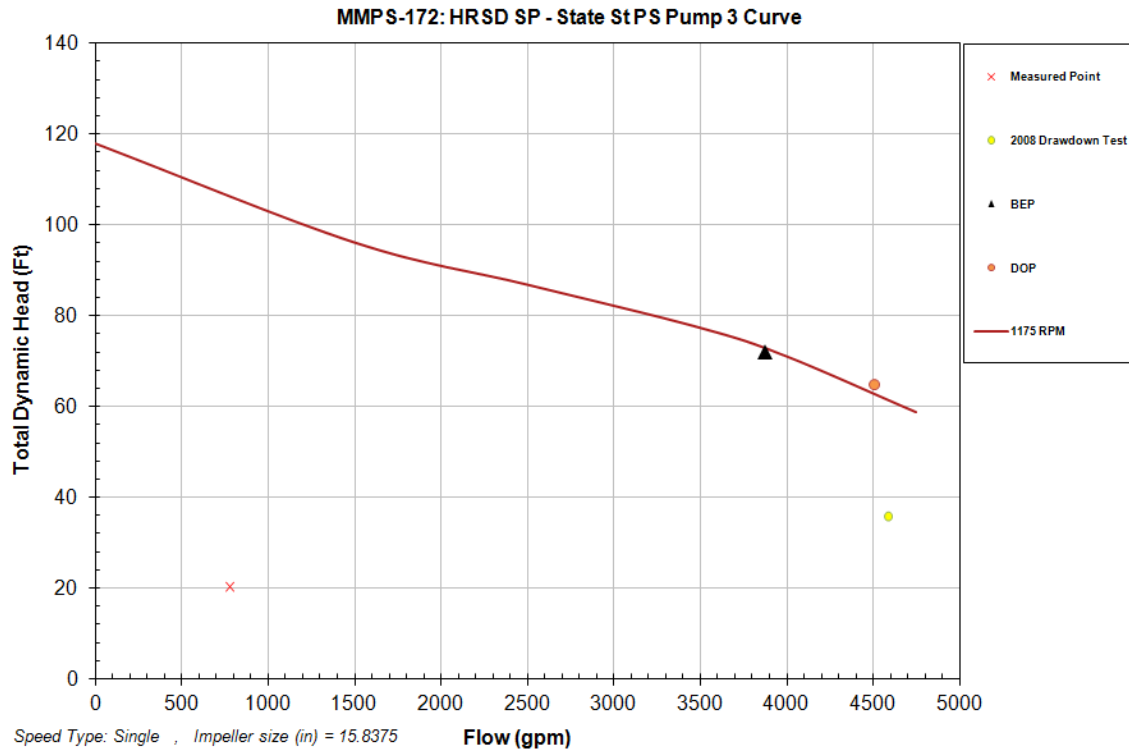
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
127	State Street	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
127	State Street	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
127	State Street	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
127	State Street	Electrical Equipment	Electrical Equipment	4	3	Good Panel Obsolete Dust Inside Panel	Schedule Corrective Action	All 480VAC equipment is aging. Lighting panel has no spare spaces available.	3
127	State Street	Instrumentation System	Instrumentation System	2	2	Good	No Immediate Action Required	No Comment	1
127	State Street	Bubbler Panel	Bubbler Panel	3	2	Equipment is old	Continue Scheduled Maintenance Activities	Consideration should be taken to upgrade the panel. .	2
127	State Street	FLOmatcher	FLOmatcher	3	2	None to Report	Continue Scheduled Maintenance Activities	Equipment is well maintained but is old and should be considered for replacement.	2
127	State Street	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
127	State Street	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment .	1
127	State Street	Transfer Switch	Transfer Switch	3	1	Panel appears to be old	Continue Scheduled Maintenance Activities	Unable to shutdown power to open the transfer switch panel	2
127	State Street	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
127	State Street	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1

Table 127-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
127	State Street	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
127	State Street	Tank 1	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1
127	State Street	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	Day Fuel Storage Tank	1

### Draw-Down Testing





State Street PS uses variable speed Flomatcher pump controls which do not give a remote indication of pump shaft speed. The plotted curve is for the maximum pump shaft speed and the measured point gives an indication of the pumps normal operating range rather than pumping capacity.



## State St Assets of Interest

State St uses Flomatcher pump controllers.



Figure 127-3. State St Flomatcher

### State St Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel & MMPS are not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system

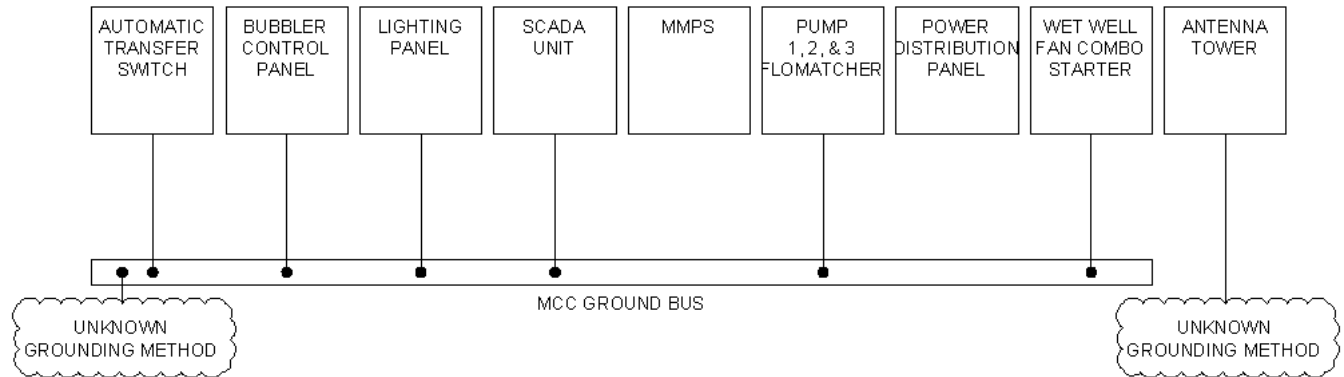


Figure 127-4. State St Grounding System

### State St Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 128 Steamboat Creek Pump Station

### Steamboat Creek Facility Description

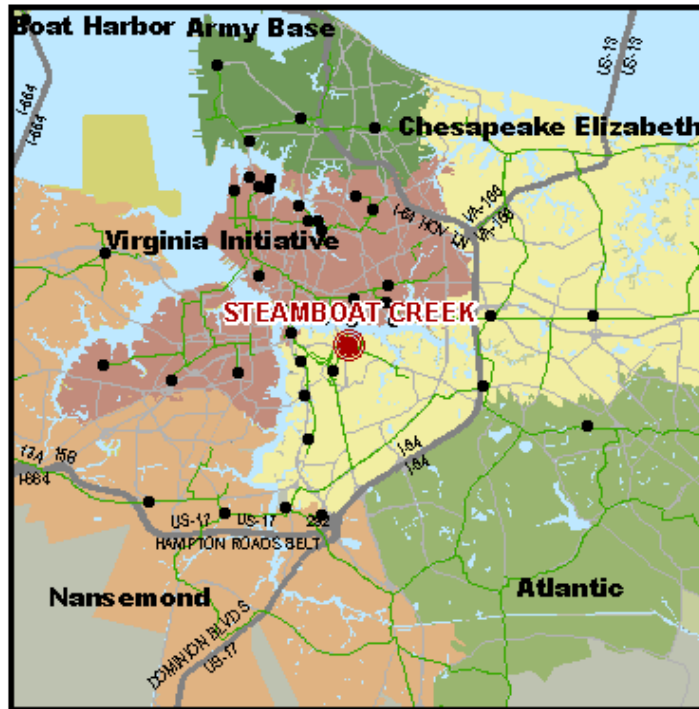


Figure 128-1. Steamboat Creek PS Location Map



Figure 128-2. Steamboat Creek PS

<b>Table 128-1. Steamboat Creek PS</b>	
<b>Pumping Facility Number</b>	<b>128</b>
<b>Date of Initial Inspection</b>	<b>6/26/2008</b>
<b>Date of Update Inspection</b>	<b>6/10/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/22/2011</b>
<b>Date of Construction</b>	<b>1948</b>
<b>Address</b>	<b>1900 E. Indian River Road, Chesapeake</b>
<b>Receiving Facility</b>	<b>Atlantic Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>39 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>1700 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>3400 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>1700 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Chicago AC, Master Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>25</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Steamboat Creek Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 128-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
128	Steamboat Creek	Building	Building	2	1	Good	No Immediate Action Required	Slight weep at #1's wall penetrations. 2400 lb crane rail in good condition.	1
128	Steamboat Creek	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	1/6 HP HVAC blower motor. 2011: Dry well ventilation is weak.	1
128	Steamboat Creek	Wet well	Wet well	3	3	Concrete Spalling	Continue Scheduled Maintenance Activities	Spalling throughout wet well. 5/2012: HRSD PM inspection on 02/22/2012 indicates no major changes from the 2008 wet well data	2
128	Steamboat Creek	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Motor 1	Motor and Controller	2	2	Good Makes Noise	No Immediate Action Required	Motor is aging; could not confirm installation year. There is noise likely from the shaft.	1
128	Steamboat Creek	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	Motor is aging; could not confirm installation year.	1
128	Steamboat Creek	Pump 1	Pump	2	2	Good	No Immediate Action Required	The pump shaft makes noise. Limited test time due to low flow.	1
128	Steamboat Creek	Pump 2	Pump	2	1	Good	No Immediate Action Required	2 separate nameplates, One MFG and one HRSD added label. Limited test time due to low flow.	1
128	Steamboat Creek	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Valves System	All Station Valves	2	1	None to Report	No Immediate Action Required	Lead joints prone to problems. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
128	Steamboat Creek	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

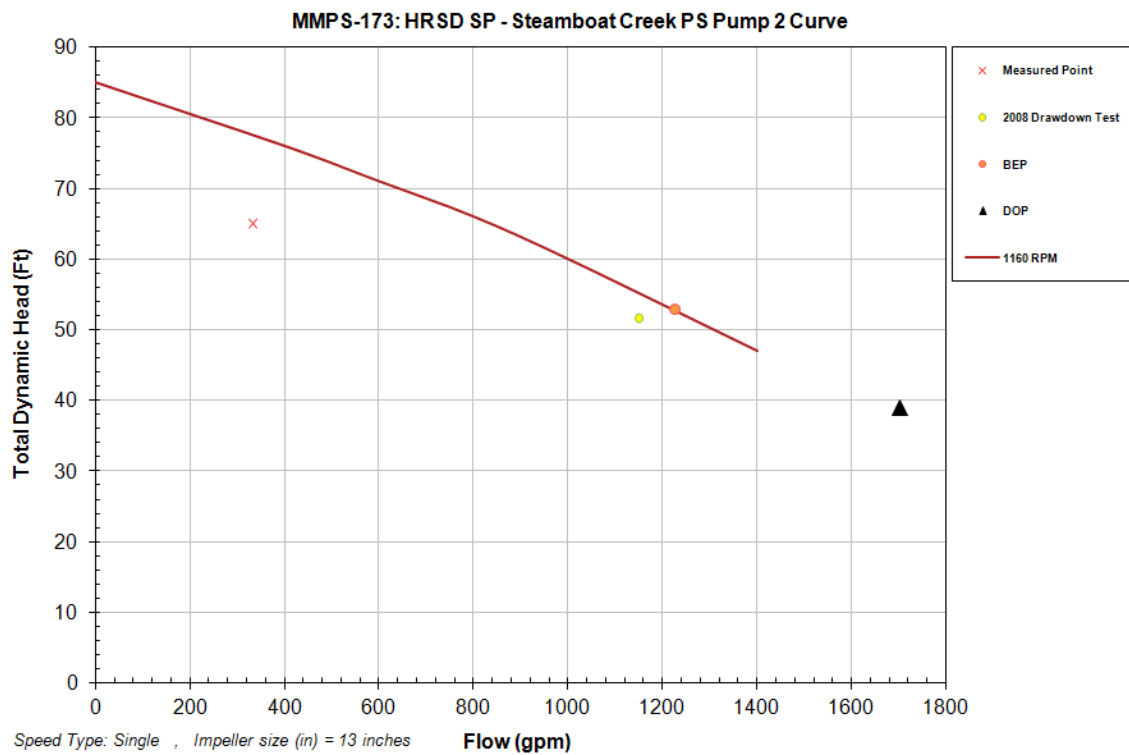
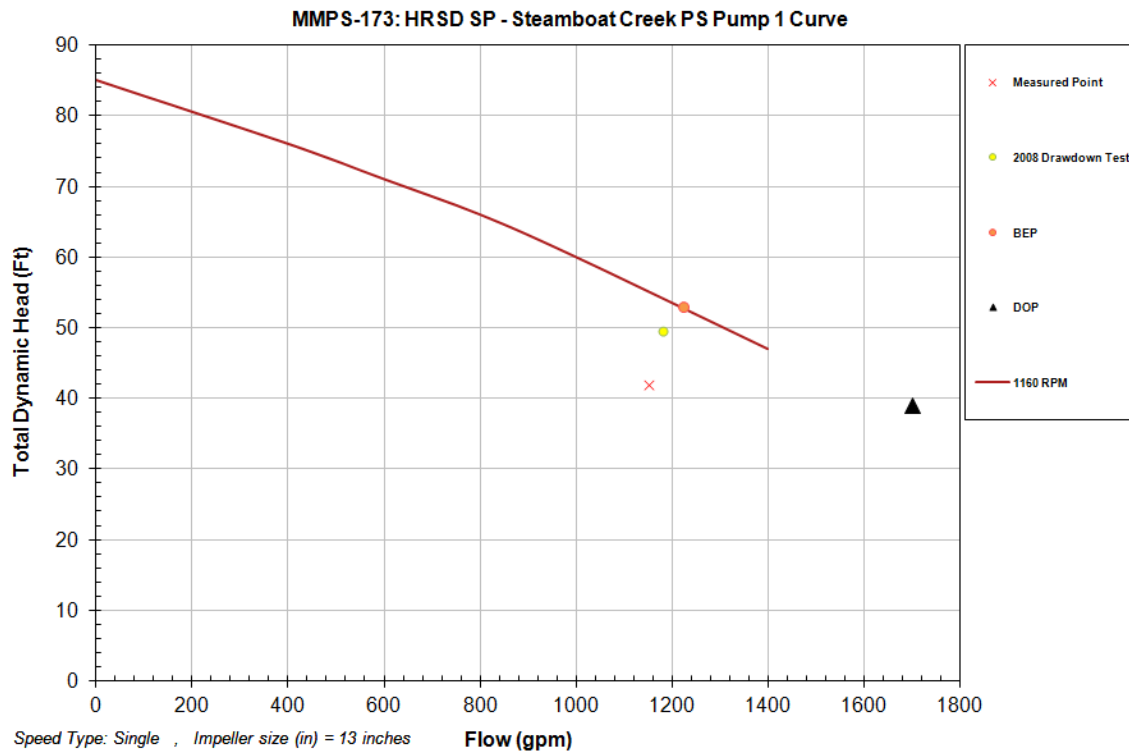
Table 128-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
128	Steamboat Creek	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
128	Steamboat Creek	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
128	Steamboat Creek	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
128	Steamboat Creek	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
128	Steamboat Creek	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
128	Steamboat Creek	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Instrumentation System	Instrumentation System	2	2	None to Report	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Bubbler Panel	Bubbler Panel	2	2	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
128	Steamboat Creek	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	Recently replaced	1
128	Steamboat Creek	Generator	Generator	1	1	Good	No Immediate Action Required	Recently replaced.	1

**Table 128-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
128	Steamboat Creek	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
128	Steamboat Creek	Tank 1	Fuel Tank	1	1	Good	No Immediate Action Required	New tank sits below generator.	1

## Draw-Down Testing





### Steamboat Creek Assets of Interest

None.

#### Steamboat Creek Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel is not bonded to the station grounding system

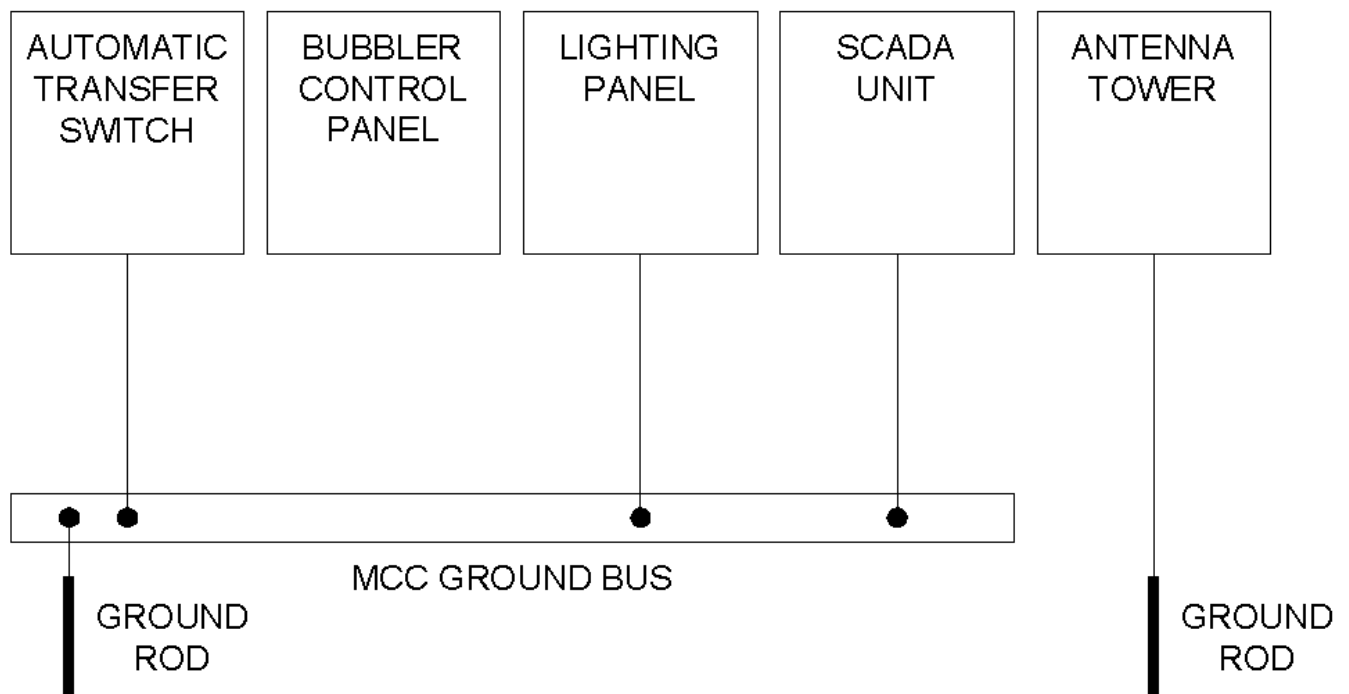


Figure 128-3. Steamboat Creek Grounding System

#### Steamboat Creek Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel

- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other



<b>Table 129-1. Taussig Blvd PS</b>	
Pumping Facility Number	129
Date of Initial Inspection	6/23/2008
Date of Update Inspection	6/22/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/19/2011
Date of Construction	1943
Address	2017 Taussig Blvd, Norfolk
Receiving Facility	Army Base Treatment Plant
Design Head (Feet)	15.25 ft., 25 ft., 28.5 ft.
Firm Pumping Capacity (GPM)	10390 GPM
Total Pumping Capacity (GPM)	14390 GPM
Number of Pumps	4
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse (3), Chicago Pump (1)
Pump Nameplate Capacity	2390 GPM, 4000 GPM, 4000 GPM, 4000 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Marathon Electric (3), Howell Red Band (1)
Motor Nameplate Power (HP)	20, 25, 50, 50
Generator Power (KW)	83

### Taussig Blvd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 129-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
129	Taussig Blvd	Building	Building	2	1	Good	No Immediate Action Required	7000 lb crane rail. The dry well slab is deteriorating from pooling water. Station has moisture issues in several locations.	1
129	Taussig Blvd	HVAC System	HVAC System	4	2	Fans Vibrate	Schedule Corrective Action	Wet well fan housing has holes from corrosion and is beginning to squeak and vibrate. Corrective Action scheduled CMMS WO # 902524. The pump room fan was recently replaced CMMS WO # 802824	3
129	Taussig Blvd	Wet well	Wet well	1	1	Good	No Immediate Action Required	Rehab appears in good condition. 5/2012: HRSD PM inspection on 02/02/2012 indicates no major changes from the 2008 wet well data.	1
129	Taussig Blvd	Influent Valve	Influent Valve	4	2	None to Report	Schedule Corrective Action	Leakage.	3
129	Taussig Blvd	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
129	Taussig Blvd	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	Could not verify any nameplate information.	1
129	Taussig Blvd	Motor 3	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
129	Taussig Blvd	Motor 4	Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Slight vibration.	1
129	Taussig Blvd	Pump 1	Pump	2	1	Good	No Immediate Action Required	Flow meter: 2600 gpm.	1

**Table 129-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
129	Taussig Blvd	Pump 2	Pump	2	1	Good Seals Leaking	No Immediate Action Required	Flow meter: 2200 gpm. Very small leak	1
129	Taussig Blvd	Pump 3	Pump	2	2	Good Cavitating	No Immediate Action Required	Flow meter: 4400 gpm. Pump made noises. Static discharge pressure: 4.9 psi, pumping pressure 12 psi.	1
129	Taussig Blvd	Pump 4	Pump	2	2	Good Bearing Noise	No Immediate Action Required	Flow meter: 4600 gpm. Stuffing box sprays water. There is a noise coming from the shaft coupling.	1
129	Taussig Blvd	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
129	Taussig Blvd	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Slight leak at #2 check valve. Pipe supports are corroding from pooling water from clogged floor drains. 6/11: HRSD checks- Performance good.	1
129	Taussig Blvd	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Check Valve Pump 2	Check Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
129	Taussig Blvd	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 129-2. Pumping Facility Asset Condition and Performance Ratings**

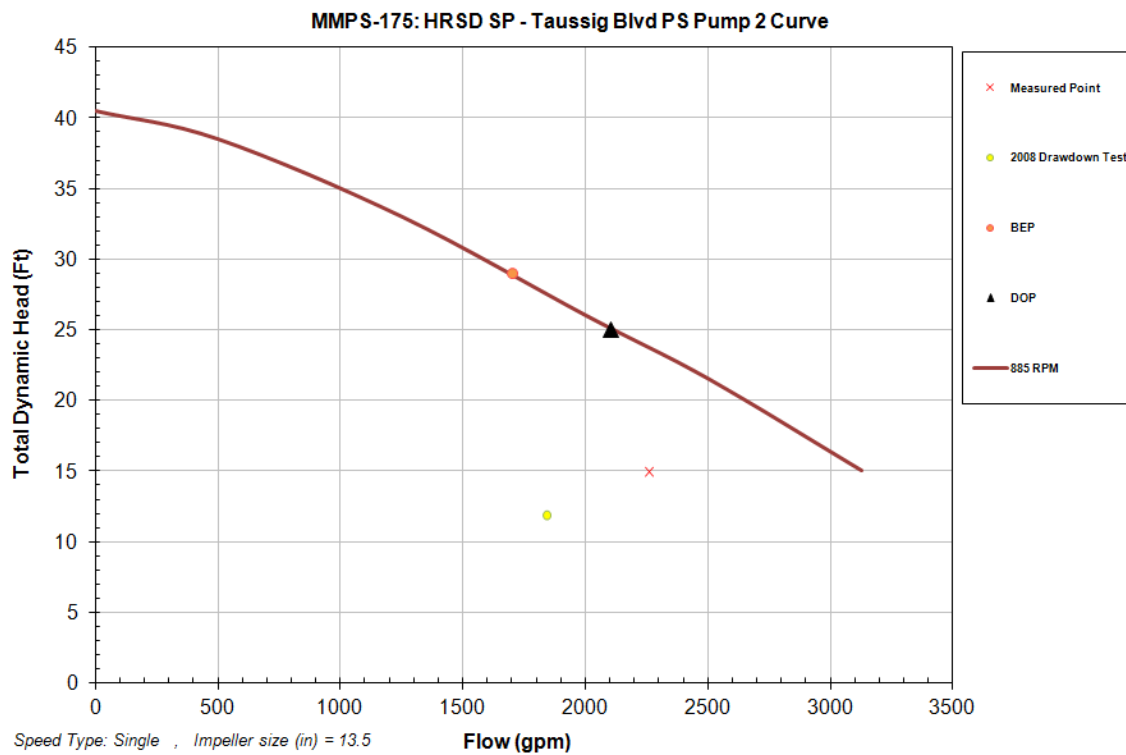
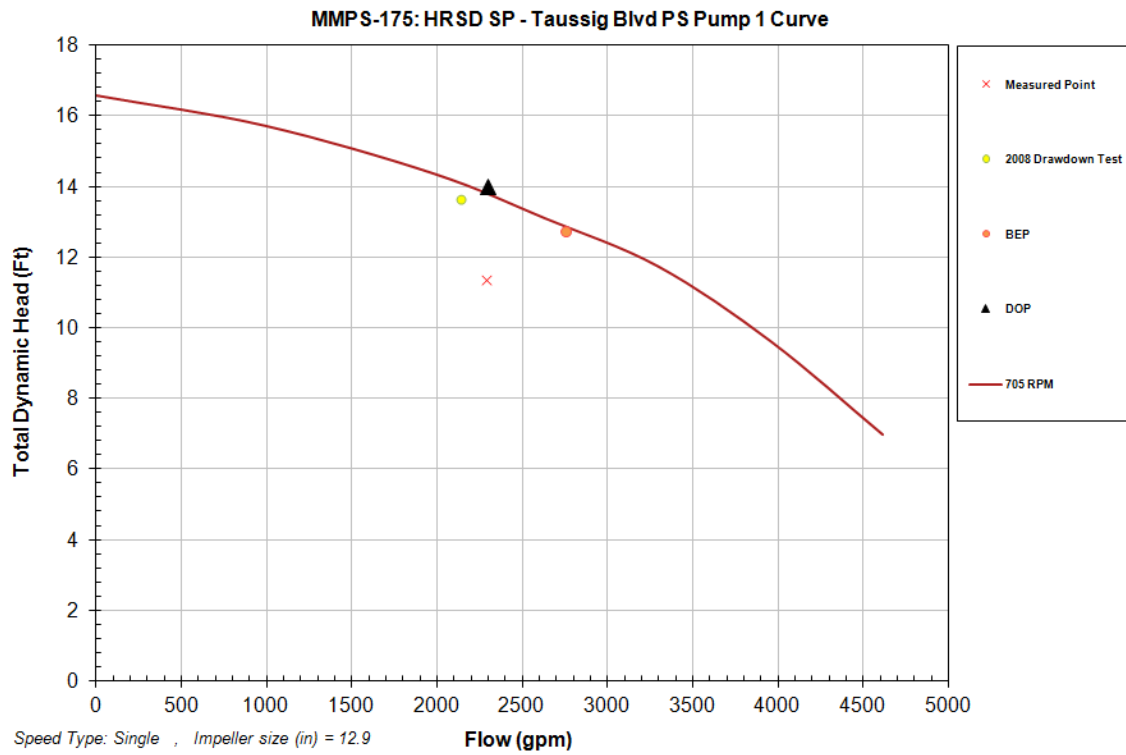
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
129	Taussig Blvd	Check Valve Pump 4	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
129	Taussig Blvd	Electrical Equipment	Electrical Equipment	3	2	Good Panel Corroded Dust Inside Panel	Continue Scheduled Maintenance Activities	Alternate power feed instead of standby generator.	2
129	Taussig Blvd	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Analog gauge/control	2
129	Taussig Blvd	Bubbler Panel	Bubbler Panel	4	2	No panel door grounding wire is installed.	Schedule Corrective Action	Indications of fire inside of the panel.	3
129	Taussig Blvd	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
129	Taussig Blvd	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
129	Taussig Blvd	SCADA	SCADA	3	1	No panel door grounding wire Terminal strip not labeled Panel is corroded	Continue Scheduled Maintenance Activities	No Comment	2

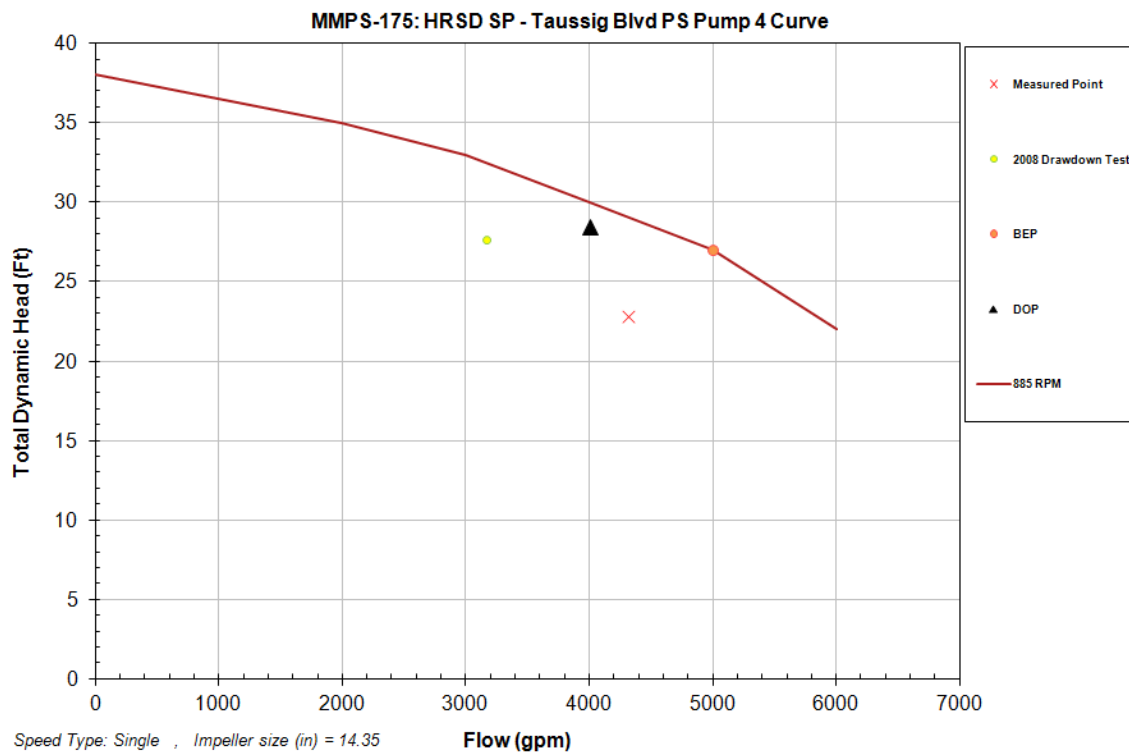
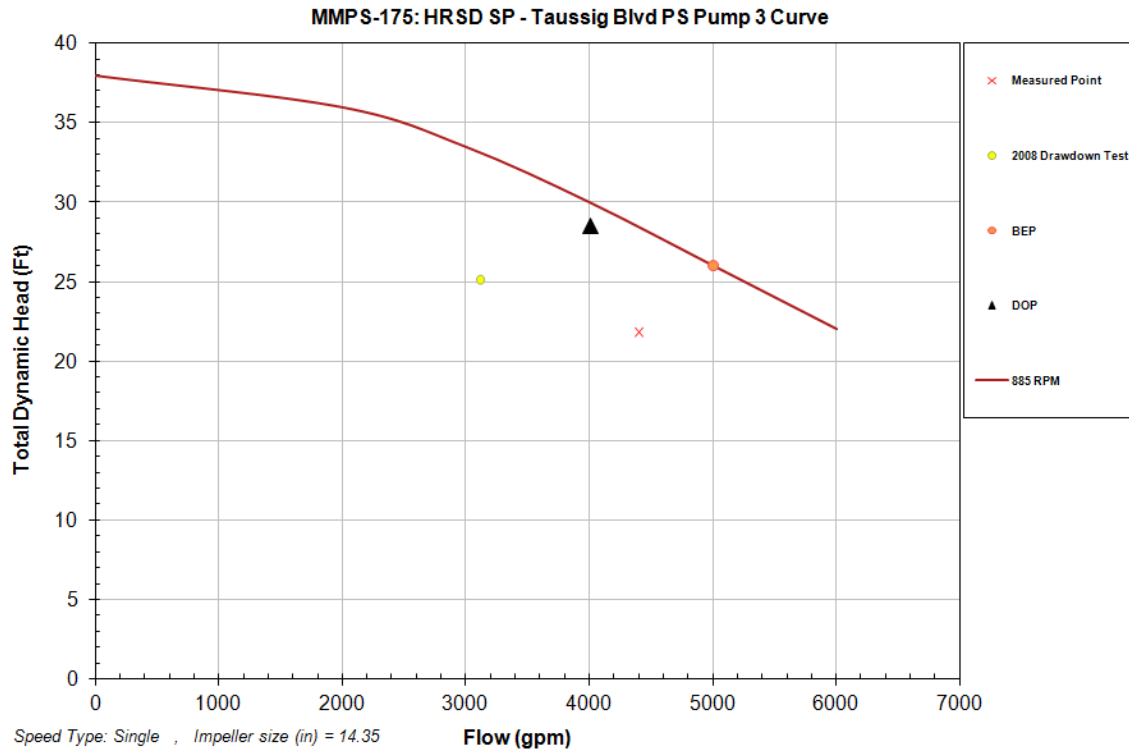
**Table 129-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
129	Taussig Blvd	Transfer Switch	Transfer Switch	4	See Comments	None to Report	Continue Scheduled Maintenance Activities	2008 inspection comment: Failed to switch to alt. power from main breaker. However, did transfer on test button. HRSD PM completed on 8/16/2011 with no issues.	2



### Draw-Down Testing





## Taussig Blvd Assets of Interest

The wet well fan is scheduled for replacement (CMMS WO # 902524). The bubbler panel shown below is deteriorating and shows evidence of previous fire damage.



Figure 129-3. Taussig Blvd Bubbler Panel

### Taussig Blvd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system

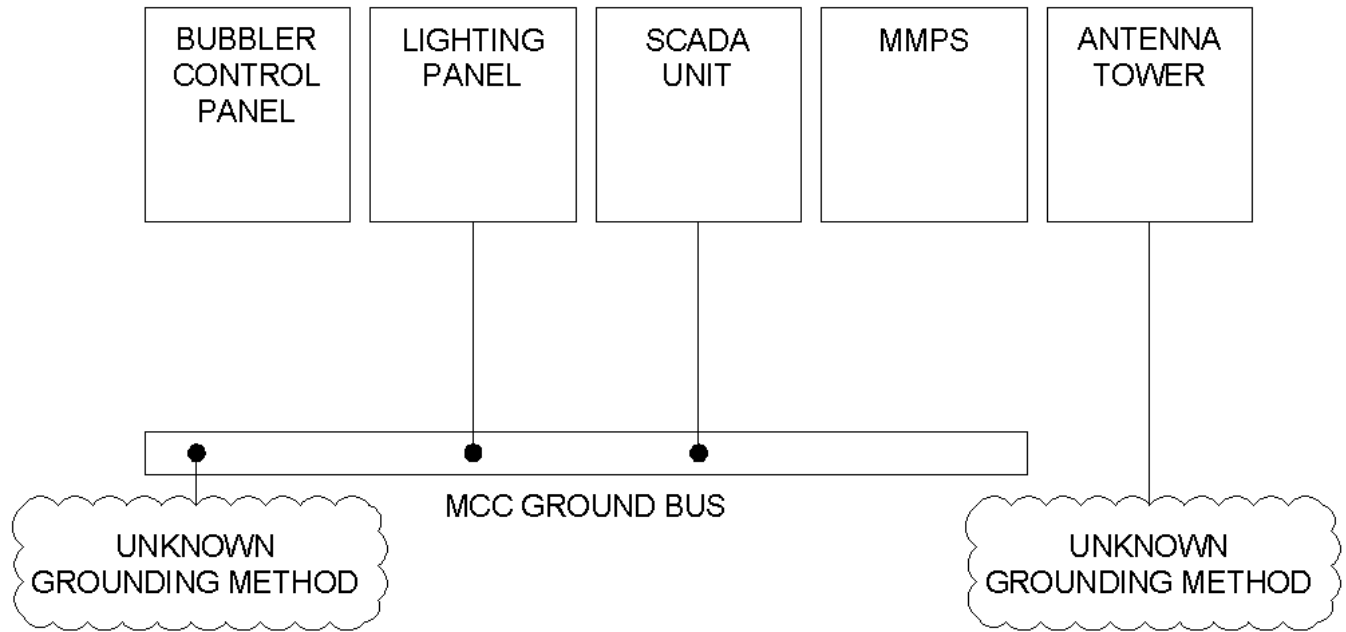


Figure 129-4. Taussig Blvd Grounding System

**Taussig Blvd Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out

- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator

### **Taussig Blvd Dual Power Feed Assessment**

Information obtained about the electrical services feeding this pump station indicates that the station has complete redundant electrical services feeding it. The local utility has a complete circuit with fusing and a transformer. The station also has an electrical feed being supplied from Navy Services. Navy Services supplies the station with a separate circuit, breaker, and transformer. This station has two complete separate circuits each with circuit protection and a transformer. This station has complete redundancy but power losses are still possible.

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## PS 130 Virginia Beach Blvd Pump Station

### Virginia Beach Blvd Facility Description



Figure 130-1. Virginia Beach Blvd PS Location Map



Figure 130-2. Virginia Beach Blvd PS

<b>Table 130-1. Virginia Beach Blvd PS</b>	
Pumping Facility Number	130
Date of Initial Inspection	6/25/2008
Date of Update Inspection	6/21/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	6/24/2011
Date of Construction	1976
Address	3614 E. Virginia Beach Blvd, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	25 ft.
Firm Pumping Capacity (GPM)	3000 GPM
Total Pumping Capacity (GPM)	4500 GPM
Number of Pumps	3
Pump Type	Dry-Pit Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1500 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse (2), General Electric (1)
Motor Nameplate Power (HP)	15
Generator Power (KW)	None

### Virginia Beach Blvd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

During the 2011 inspection, pump # 3 was in the process of being retrofitted with a dry-pit submersible motor so it was not evaluated. The other two pumps recently had the same retrofit.



**Table 130-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
130	Virginia Beach Blvd	Building	Building	3	2	None to Report	Continue Scheduled Maintenance Activities	Water damage on ceiling. There is no permanent lift point to pull the dry well equipment. The wooden beam lift point is tagged out.	2
130	Virginia Beach Blvd	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	HVAC blower: 1/3 HP. Dry well ventilation is weak. Wet well and motor control rooms are passive ventilation only.	1
130	Virginia Beach Blvd	Wet well	Wet well	4	2	Exposed Rebar Concrete Spalling	Schedule Corrective Action	5/2012: HRSD PM inspection on 02/17/2012 indicates no major changes from the 2008 wet well data.	3
130	Virginia Beach Blvd	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
130	Virginia Beach Blvd	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
130	Virginia Beach Blvd	Motor 3	Motor and Controller	See Comments	See Comments	None to Report	Continue Scheduled Maintenance Activities	Motor was in the process of being replaced during inspection.	2
130	Virginia Beach Blvd	Pump 1	Pump	2	1	Good	No Immediate Action Required	Test conditions: 1230 gpm, 3.2 fps	1
130	Virginia Beach Blvd	Pump 2	Pump	2	1	Good	No Immediate Action Required	Test conditions: 1000 gpm, 2.6 fps. The pipes are not mounted square with the pipe supports.	1
130	Virginia Beach Blvd	Pump 3	Pump	See Comments	See Comments	None to Report	Continue Scheduled Maintenance Activities	Pump was in the process of being retrofitted with a new motor during inspection.	2
130	Virginia Beach Blvd	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	Sump pump set point allows the sump to fill to nearly overflowing.	1

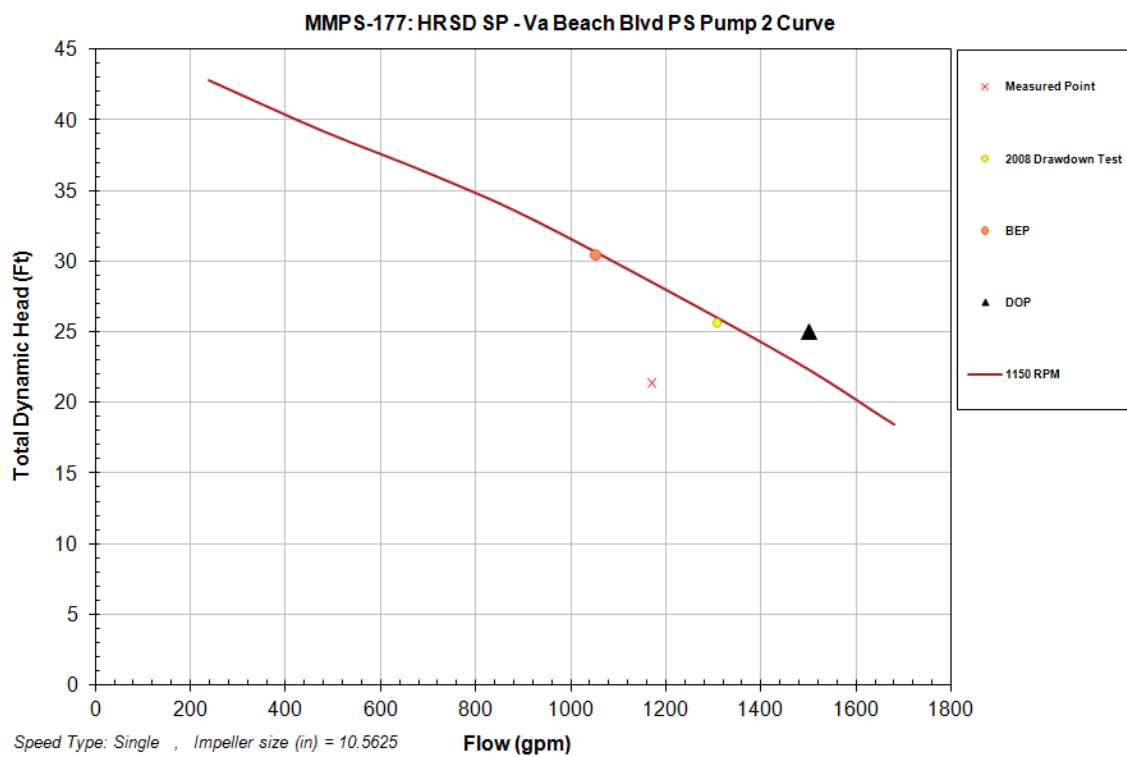
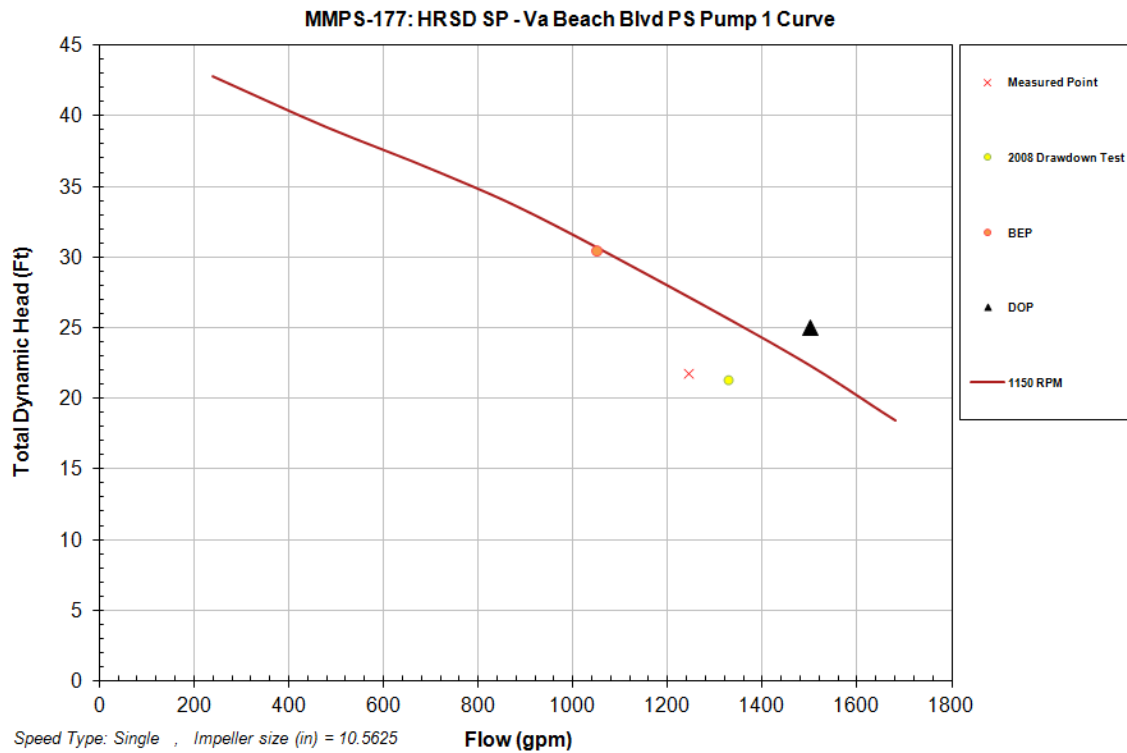
**Table 130-2. Pumping Facility Asset Condition and Performance Ratings**

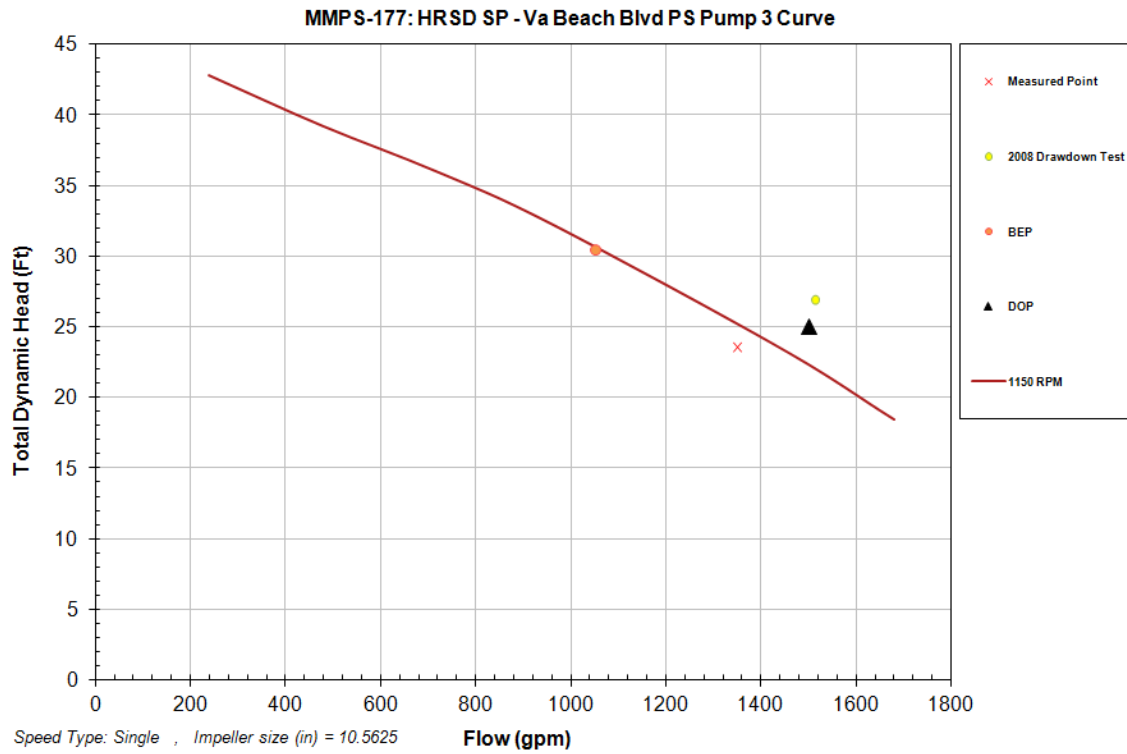
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
130	Virginia Beach Blvd	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Discharge #1 is dripping. Check valve #3 not checked for performance because pump not in service. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
130	Virginia Beach Blvd	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
130	Virginia Beach Blvd	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
130	Virginia Beach Blvd	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
130	Virginia Beach Blvd	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
130	Virginia Beach Blvd	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
130	Virginia Beach Blvd	Check Valve Pump 3	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
130	Virginia Beach Blvd	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
130	Virginia Beach Blvd	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
130	Virginia Beach Blvd	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
130	Virginia Beach Blvd	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No automatic back up power source.	1
130	Virginia Beach Blvd	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Autocon analog gauge/control	1

**Table 130-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
130	Virginia Beach Blvd	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
130	Virginia Beach Blvd	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
130	Virginia Beach Blvd	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
130	Virginia Beach Blvd	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
130	Virginia Beach Blvd	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1

### Draw-Down Testing





The Virginia Beach Blvd pumps were upgraded in 2011 with dry pit submersible motors.

## Virginia Beach Blvd Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Virginia Beach Blvd wet well is deteriorating.



Figure 130-3. Virginia Beach Blvd Wet well

## Virginia Beach Blvd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system

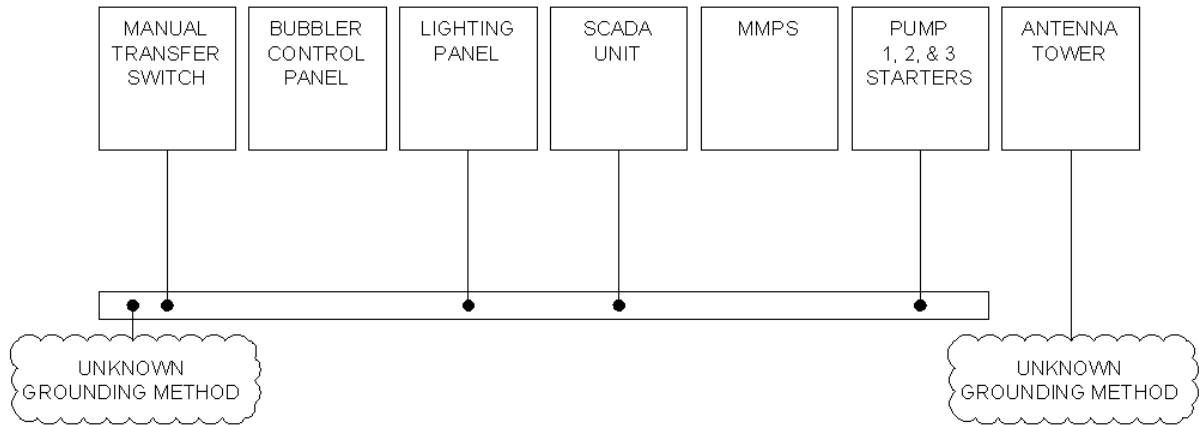


Figure 130-4. Virginia Beach Blvd Grounding System

### Virginia Beach Blvd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

– No automatic back up power source

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## PS 131 Washington District Pump Station

### Washington District Facility Description

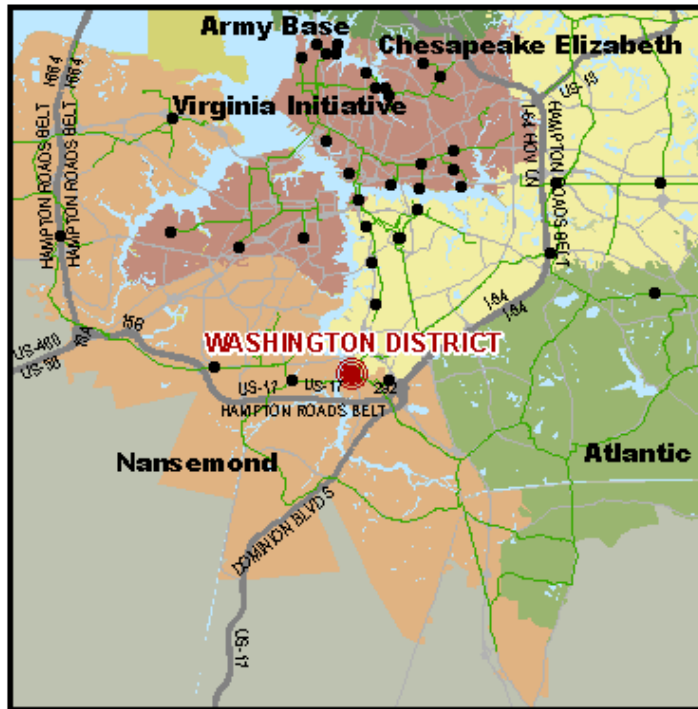


Figure 131-1. Washington District PS Location Map



Figure 131-2. Washington District PS

<b>Table 131-1. Washington District PS</b>	
Pumping Facility Number	131
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/9/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/8/2011
Date of Construction	1979
Address	1728 Great Bridge Blvd, Chesapeake
Receiving Facility	Atlantic Treatment District
Design Head (Feet)	40.5 ft., 65 ft.
Firm Pumping Capacity (GPM)	6500 GPM
Total Pumping Capacity (GPM)	9300 GPM
Number of Pumps	4
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1400 GPM, 2800 GPM, 2800 GPM, 2300 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Reliance Electric (1), General Electric (3)
Motor Nameplate Power (HP)	30, 75, 75, 75
Generator Power (KW)	None

### Washington District Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 131-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
131	Washington District	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
131	Washington District	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	3/4 HP HVAC blower.	1
131	Washington District	Wet well	Wet well	4	1	Concrete Spalling Exposed Rebar	Schedule Corrective Action	5/2012: HRSD PM inspection on 02/24/2012 does not specify any wet well issues.	3
131	Washington District	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
131	Washington District	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
131	Washington District	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	2 stage starter. Motor makes atypical noise at startup.	1
131	Washington District	Motor 3	Motor and Controller	2	1	Good	No Immediate Action Required	2 stage starter. Motor does not sound like a 2 stage starter.	1
131	Washington District	Motor 4	Motor and Controller	2	1	Good	No Immediate Action Required	2 stage starter. Motor does not sound like a 2 stage starter.	1
131	Washington District	Pump 1	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Minor shaft deflection.	2
131	Washington District	Pump 2	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Minor shaft deflection. Stuffing box needs tightened. Pump made noise at start-up.	2
131	Washington District	Pump 3	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Pump made noises. The stuffing box drain was plugged.	2
131	Washington District	Pump 4	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Packing throwing small amount of water. Stuffing box drain clogged.	1

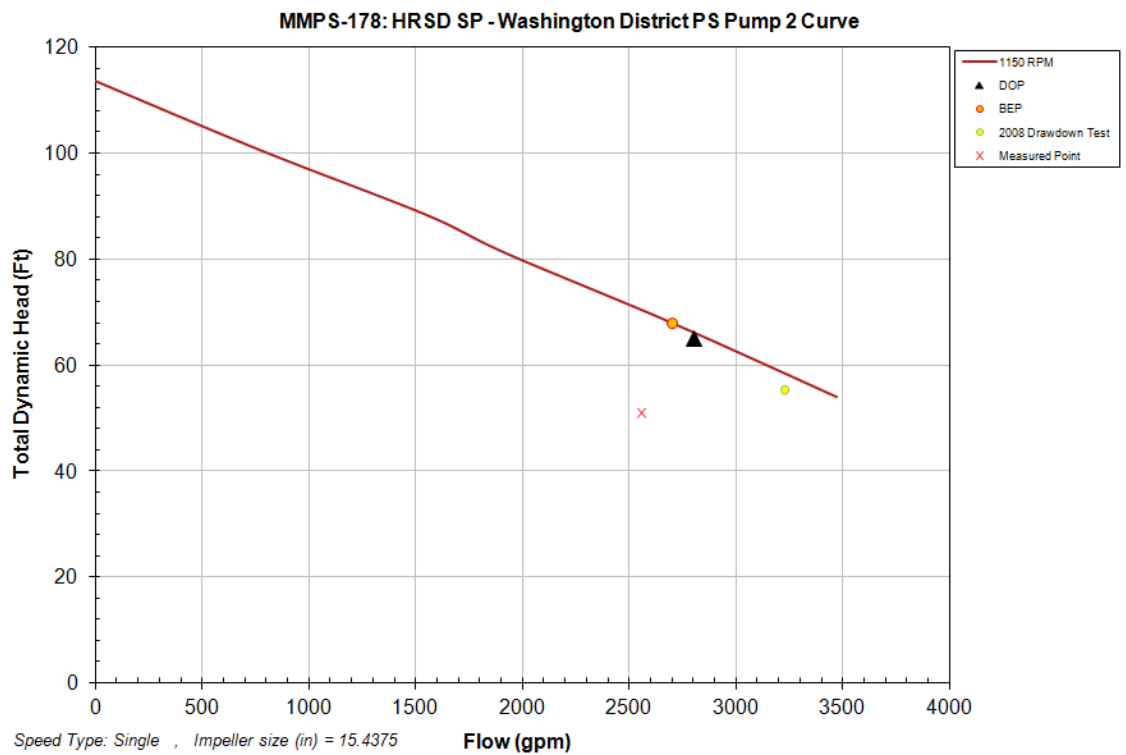
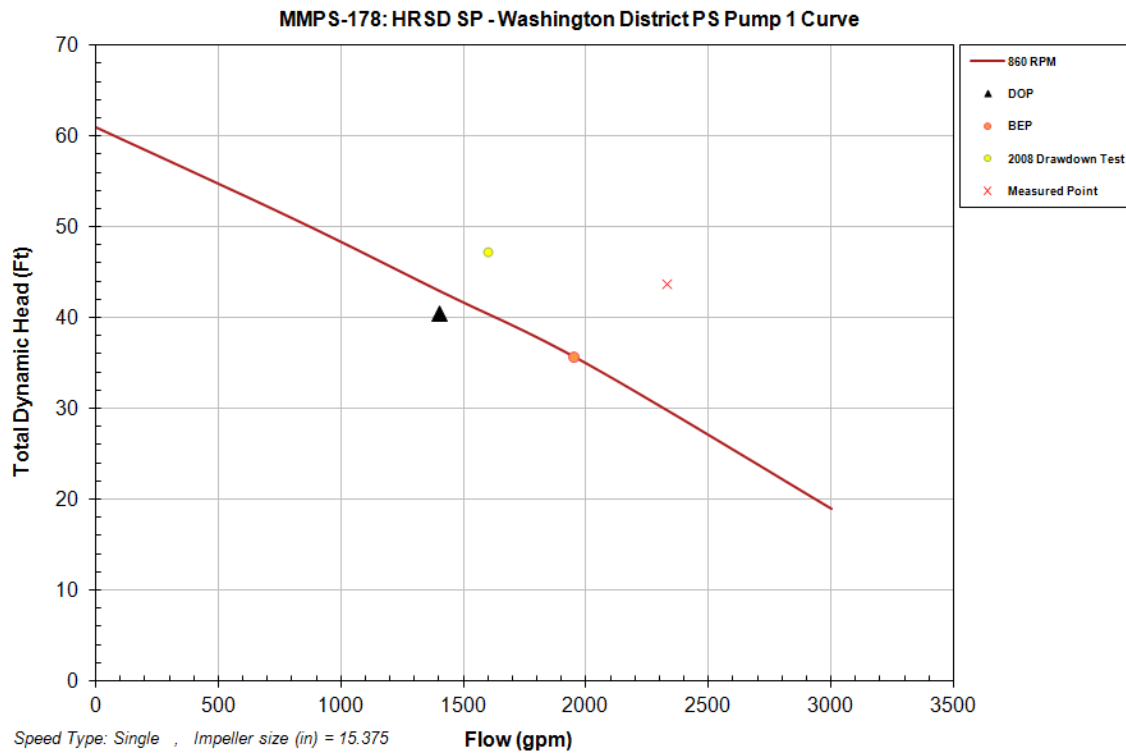
Table 131-2. Pumping Facility Asset Condition and Performance Ratings

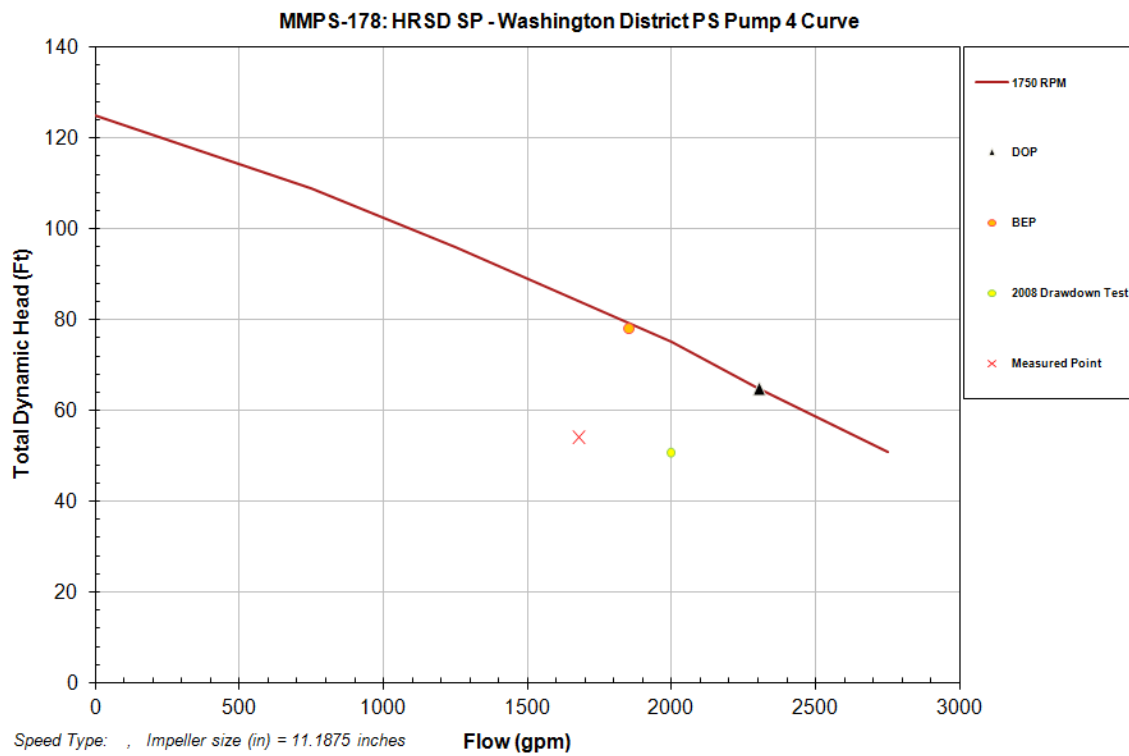
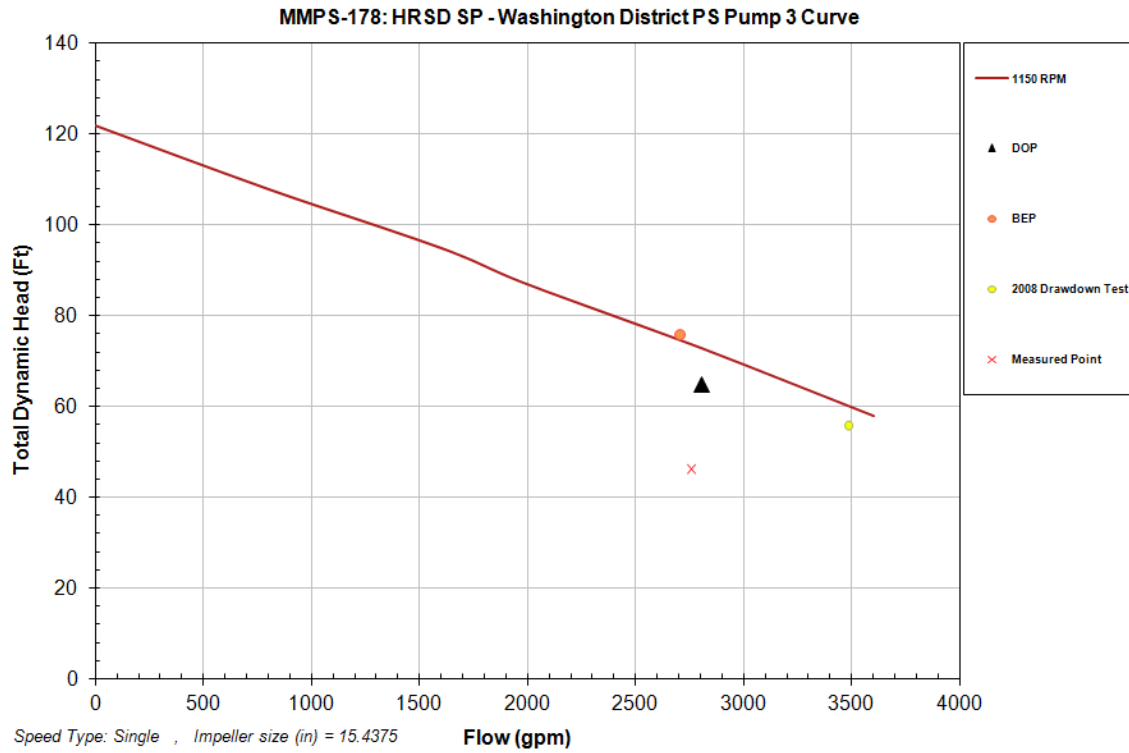
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
131	Washington District	Pump 5	Sump Pump	2	1	Good	No Immediate Action Required	Station has 2 sump pumps in the same sump.	1
131	Washington District	Pump 6	Sump Pump	2	1	Good	No Immediate Action Required	Station has 2 sump pumps in the same sump.	1
131	Washington District	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valve #2 slams shut 6/11: HRSD inspections indicate no problems with valve operation.	1
131	Washington District	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Check Valve Pump 2	Check Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
131	Washington District	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Check Valve Pump 4	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 131-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
131	Washington District	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
131	Washington District	Electrical Equipment	Electrical Equipment	2	2	Good Panel Obsolete Dust Inside Panel	No Immediate Action Required	Alternate power feed instead of standby generator. Utility panel is showing signs of corrosion. Left side lighting panel could not be opened.	1
131	Washington District	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
131	Washington District	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed. Indications of a fire inside of the panel.	Continue Scheduled Maintenance Activities	No Comment	2
131	Washington District	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
131	Washington District	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
131	Washington District	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
131	Washington District	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1

## Draw-Down Testing







## Washington District Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Washington District wet well is deteriorating.



Figure 131-3. Washington District Wet Well

## Washington District Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 4 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel & MMPS are not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel & MMPS are not bonded to the station grounding system



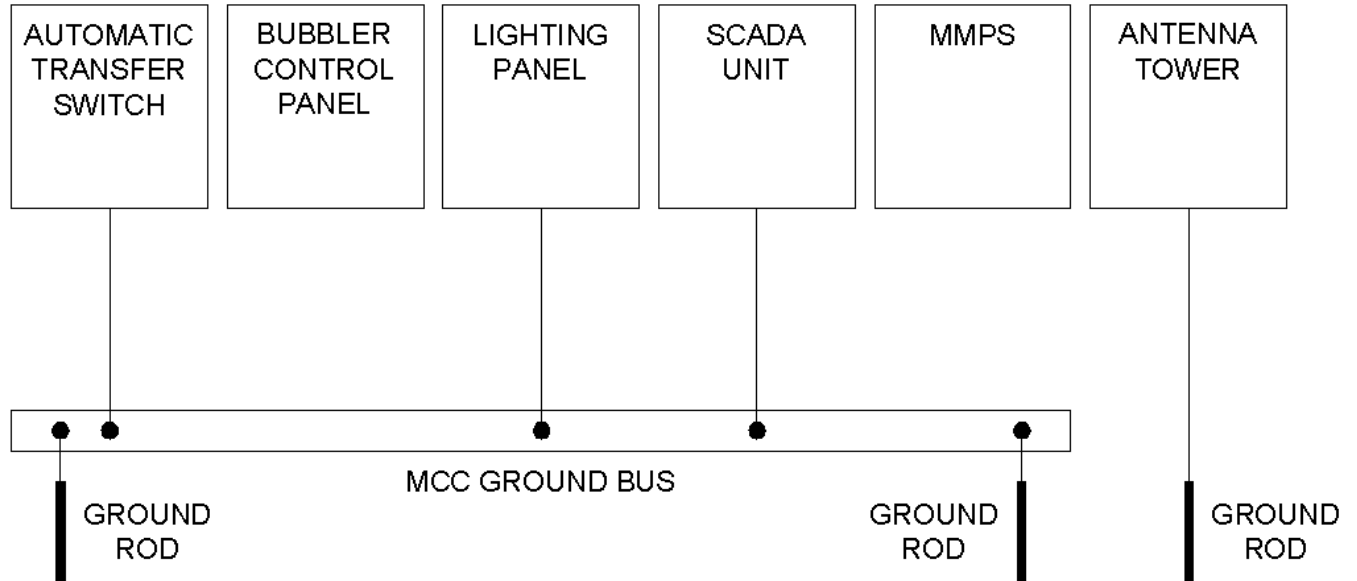


Figure 131-4. Washington District Grounding System

### Washington District Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion

- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator

### **Washington District Dual Power Feed Assessment**

Information obtained from the local electrical utility indicates that this station has redundant transformers each with a different circuit feeding it from the utility. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.

## PS 132 Willoughby Ave Pump Station

### Willoughby Ave Facility Description



Figure 132-1. Willoughby Ave PS Location Map



Figure 132-2. Willoughby Ave PS

<b>Table 132-1. Willoughby Ave PS</b>	
<b>Pumping Facility Number</b>	<b>132</b>
<b>Date of Initial Inspection</b>	<b>6/25/2008</b>
<b>Date of Update Inspection</b>	<b>6/10/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/23/2011</b>
<b>Date of Construction</b>	<b>1948</b>
<b>Address</b>	<b>1912 Willoughby Avenue, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>65 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>1000 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>2000 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Allis Chalmers</b>
<b>Pump Nameplate Capacity</b>	<b>1000 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Master Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>40</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Willoughby Ave Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

**Table 132-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
132	Willoughby Avenue	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
132	Willoughby Avenue	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak.	1
132	Willoughby Avenue	Wet well	Wet well	4	2	Concrete Spalling	Schedule Corrective Action	Moderate spalling concentrated mostly around typical water surface level and intermediate deck underside 5/2012: HRSD PM inspection on 02/27/2012 indicates no major changes from the 2008 wet well data.	3
132	Willoughby Avenue	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
132	Willoughby Avenue	Motor 1	Motor and Controller	3	3	Shaft Bearing Noise	Continue Scheduled Maintenance Activities	Two stage start functionality has failed but has been operating without performance problems. The motor made noise but not necessarily indicative of mechanical failure.	2
132	Willoughby Avenue	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
132	Willoughby Avenue	Pump 1	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Lower shaft above pump coupling has deflection.	1
132	Willoughby Avenue	Pump 2	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Lower shaft above pump coupling has a slight deflection.	1
132	Willoughby Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

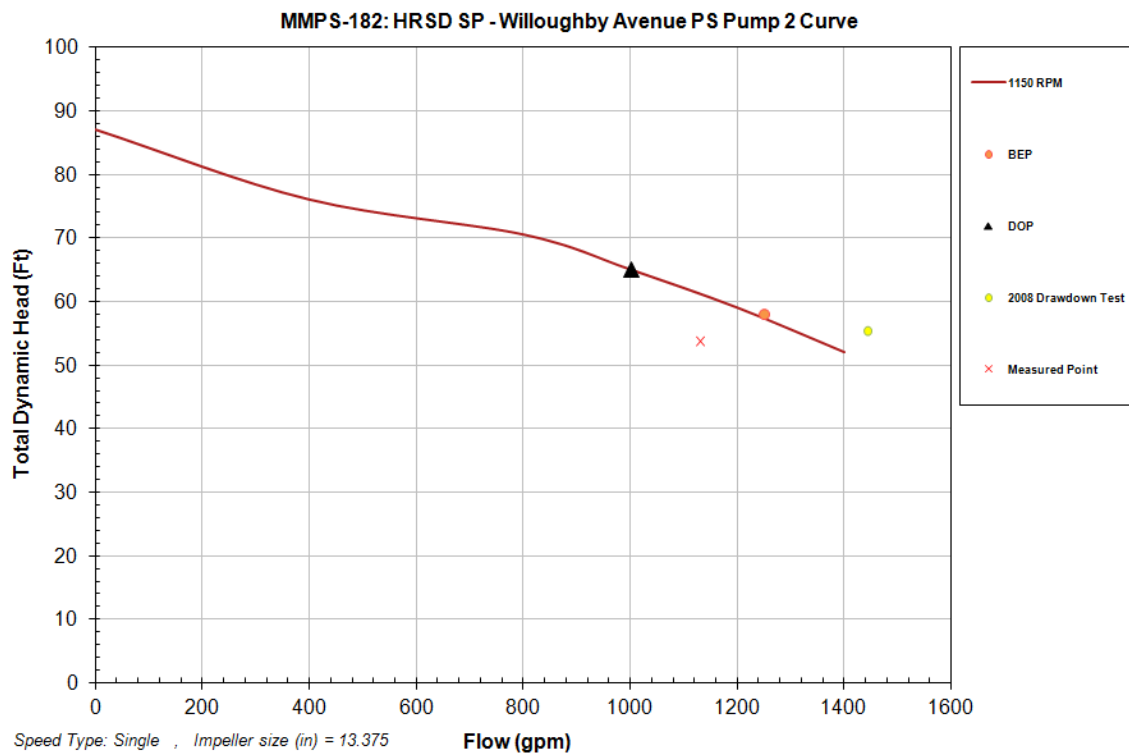
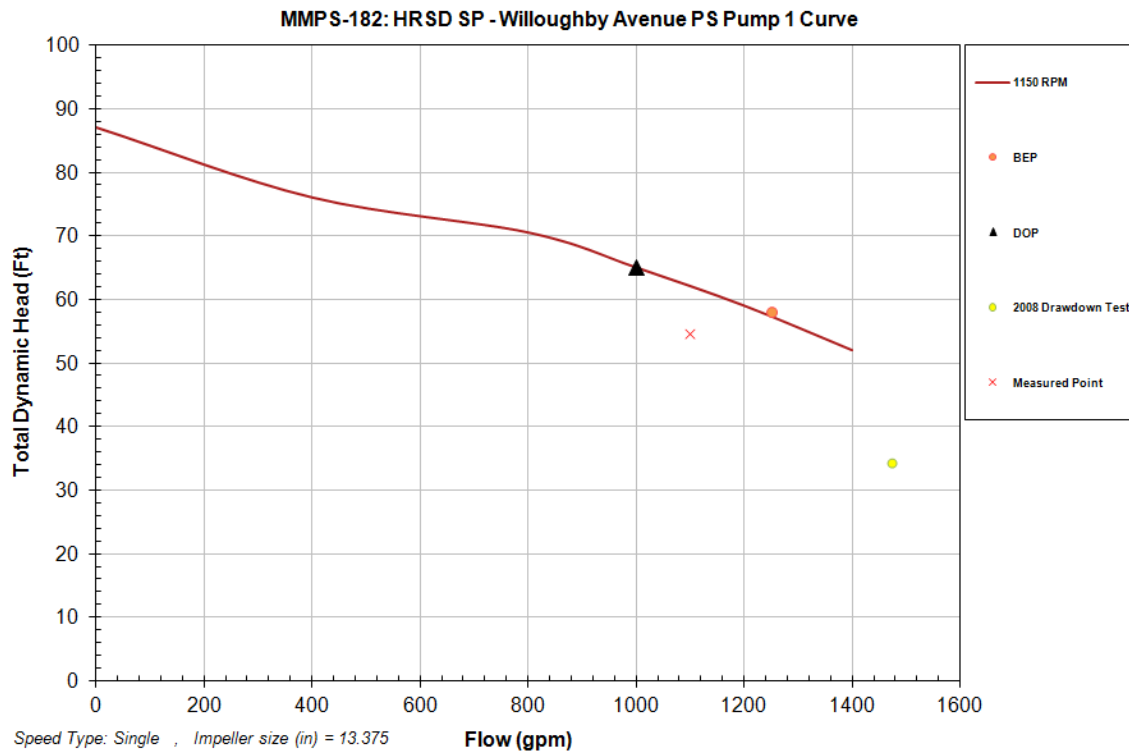
**Table 132-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
132	Willoughby Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	#1 Suction shows signs of leakage at the shaft. 6/11: HRSD inspections indicate no problems with isolation valve operation	1
132	Willoughby Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
132	Willoughby Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
132	Willoughby Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
132	Willoughby Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
132	Willoughby Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
132	Willoughby Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
132	Willoughby Avenue	Electrical Equipment	Electrical Equipment	3	2	Good Dust Inside Panel	Continue Scheduled Maintenance Activities	No automatic back up power source. Evidence of a fire in the starter panel.	2
132	Willoughby Avenue	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
132	Willoughby Avenue	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
132	Willoughby Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
132	Willoughby Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

**Table 132-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
132	Willoughby Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
132	Willoughby Avenue	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1

### Draw-Down Testing





### Willoughby Ave Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Willoughby Ave wet well is deteriorating.



Figure 132-3. Willoughby Ave Wet well

### Willoughby Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - Bubbler control panel, motor starters, & MMPS are not bonded to the station grounding system

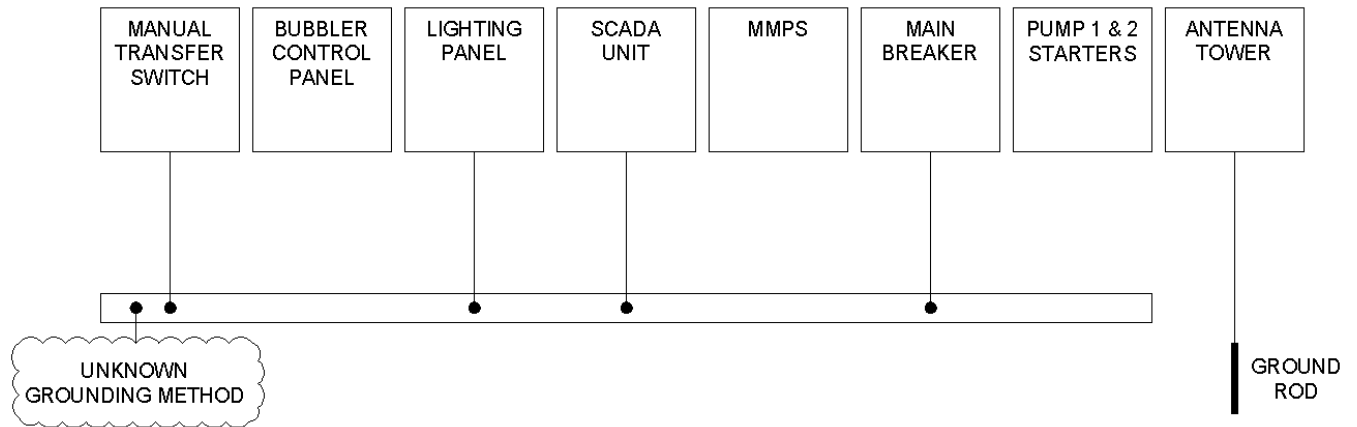


Figure 132-4. Willoughby Ave Grounding System

### Willoughby Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - No automatic back up power source

## PS 133 Providence Rd Pressure Reducing Station

### Providence Rd Facility Description

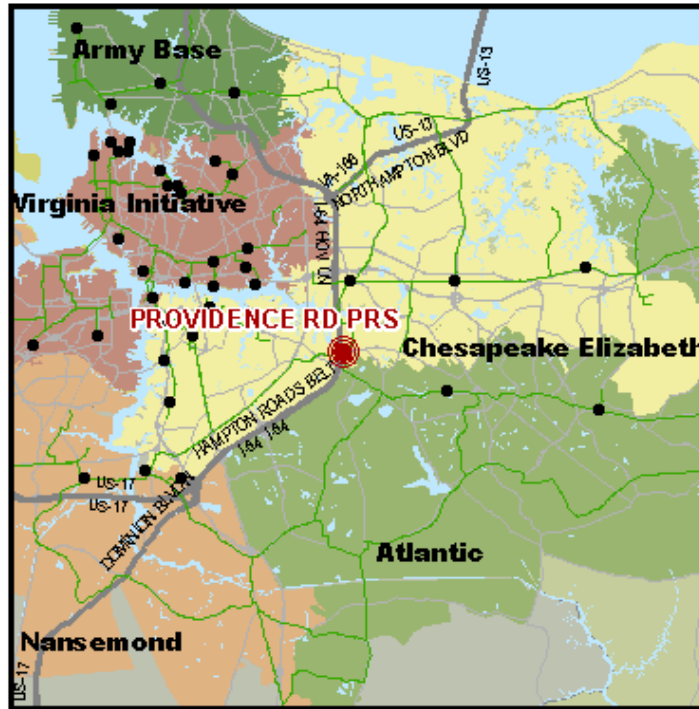


Figure 133-1. Providence Rd PRS Location Map



Figure 133-2. Providence Rd PRS

<b>Table 133-1. Providence Rd PRS</b>	
Pumping Facility Number	133
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/24/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/22/2011
Date of Construction	1979
Address	5729 Old Providence Road, Virginia Beach
Receiving Facility	Atlantic Treatment Plant
Design Head (Feet)	45 ft.
Firm Pumping Capacity (GPM)	21000 GPM
Total Pumping Capacity (GPM)	31500 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Allis Chalmers
Pump Nameplate Capacity	10500 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Continental Electric
Motor Nameplate Power (HP)	150
Generator Power (KW)	480

### Providence Rd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Providence Rd pressure reducing station was taken out of operation so performance scores were not given. The data presented is based on visual observations of equipment. Any performance related comments for assets without performance scores are from the 2008 inspection data and were not verified due to equipment being tagged out.

Table 133-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
133	Providence Road	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
133	Providence Road	HVAC System	HVAC System	2	2	Good	No Immediate Action Required	Louvers do not move - One motor disconnected.	1
133	Providence Road	Motor 1	Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Tagged out for 2011 inspection.	2
133	Providence Road	Motor 2	Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Tagged out for 2011 inspection.	2
133	Providence Road	Motor 3	Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Tagged out for 2011 inspection.	2
133	Providence Road	Pump 1	Pump	3	See Comments	Cavitating	Continue Scheduled Maintenance Activities	Observation from 2008 inspection: Pump made noises. Tagged out for 2011 inspection.	2
133	Providence Road	Pump 2	Pump	3	See Comments	Cavitating	Continue Scheduled Maintenance Activities	Observation from 2008 inspection: Pump made noises. Tagged out for 2011 inspection.	2

**Table 133-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
133	Providence Road	Pump 3	Pump	3	See Comments	Cavitating	Continue Scheduled Maintenance Activities	Observation from 2008 inspection: Pump made noises. Tagged out for 2011 inspection.	2
133	Providence Road	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
133	Providence Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Bypass isolation and check valves - 36" Check valves not assessed for performance because station is off line. 6/11: HRSD inspections indicate no problems with isolation valve operation	1
133	Providence Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
133	Providence Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
133	Providence Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
133	Providence Road	Check Valve Pump 1	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
133	Providence Road	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
133	Providence Road	Check Valve Pump 3	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
133	Providence Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
133	Providence Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1



Table 133-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
133	Providence Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
133	Providence Road	Electrical Equipment	Electrical Equipment	2	2	Good	Continue Scheduled Maintenance Activities	No Comment	2
133	Providence Road	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Flomatchers	2
133	Providence Road	Control Panel	Control Panel	4	2	No panel door grounding wire is installed.	Schedule Corrective Action	Panel as well as internal components are old & outdated. Consideration should be taken to upgrade the panel. . Panel scheduled for replacement in CIP.	3
133	Providence Road	FLOmatcher	FLOmatcher	3	2	None to Report	Continue Scheduled Maintenance Activities	Equipment is well maintained but is old and should be considered for replacement.	2
133	Providence Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
133	Providence Road	SCADA	SCADA	2	1	None to Report	No Immediate Action Required	No panel door grounding wire. Terminal strip not labeled. Uncapped wires loose in the panel.	1
133	Providence Road	Velocity Profiler	Velocity Profiler	1	1	Loose ground wire in panel 2	No Immediate Action Required	No Comment	1
133	Providence Road	Transfer Switch	Transfer Switch	2	1	Good Corrosion	No Immediate Action Required	Corrosion forming on the ground and neutral lugs.	1
133	Providence Road	Engine	Generator Drive Engine	2	1	Good Leaking Fluids	No Immediate Action Required	Slight leak	1
133	Providence Road	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
133	Providence Road	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1

Table 133-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
133	Providence Road	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
133	Providence Road	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1



## Drawdown Testing

Not applicable.

## Providence Rd Assets of Interest

The station uses Flomatcher pump controllers. This station is scheduled for improvements and / or replacement in the Interim System Improvements.



Figure 133-3. Providence Rd Flomatcher

## Providence Rd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Control panel & velocity profilers are not protected by a surge suppressor

- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system

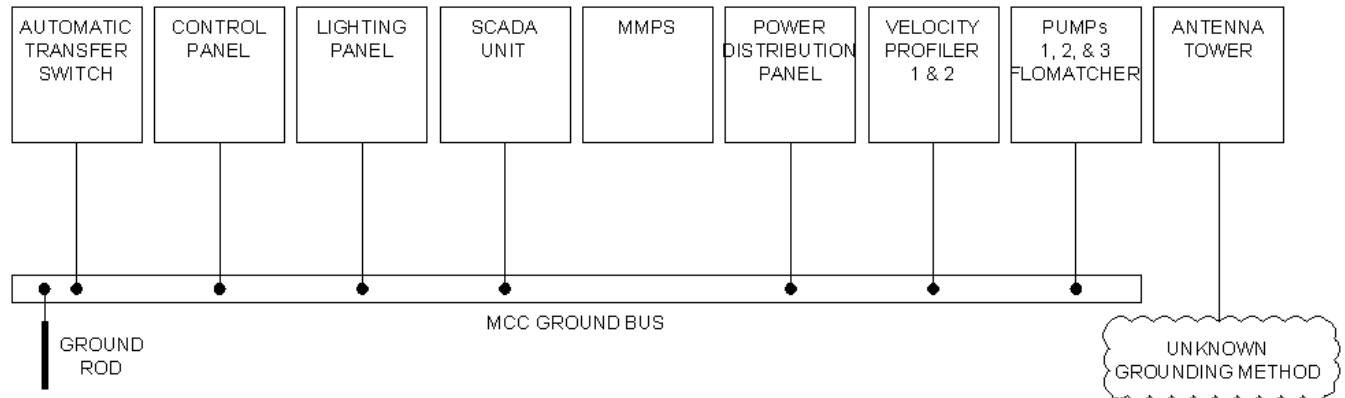


Figure 133-4. Providence Rd Grounding System

**Providence Rd Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

# PS 134 Pughsville Pressure Reducing Station

## Pughsville Facility Description



Figure 134-1. Pughsville PRS Location Map



Figure 134-2. Pughsville PRS

<b>Table 134-1. Pughsville PRS</b>	
Pumping Facility Number	134
Date of Initial Inspection	7/2/2008
Date of Update Inspection	6/7/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/7/2011
Date of Construction	1979
Address	4725 Shoulders Hill Road, Suffolk
Receiving Facility	Nansemond Treatment Plant
Design Head (Feet)	75 ft.
Firm Pumping Capacity (GPM)	11200 GPM
Total Pumping Capacity (GPM)	16800 GPM
Number of Pumps	3
Pump Type	Direct-coupled Centrifugal
Pump Manufacturer	Yeoman
Pump Nameplate Capacity	5600 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Siemens
Motor Nameplate Power (HP)	150
Generator Power (KW)	300

### **Pughsville Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 134-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
134	Pughsville Road	Building	Building	2	1	Good	No Immediate Action Required	2 space heaters in fair condition.	1
134	Pughsville Road	HVAC System	HVAC System	2	3	Good	Continue Scheduled Maintenance Activities	Intake louver is propped open.	2
134	Pughsville Road	Motor 1	Motor and Controller	2	3	Good Vibrates	Continue Scheduled Maintenance Activities	Could not read nameplate. Pump base plate is deflected down about 1/4 in. at the center.	2
134	Pughsville Road	Motor 2	Motor and Controller	2	3	Good Vibrates	Continue Scheduled Maintenance Activities	Could not read nameplate. Pump base plate is deflected down about 1/4 in. at the center.	2
134	Pughsville Road	Motor 3	Motor and Controller	2	3	Good Vibrates	Continue Scheduled Maintenance Activities	Could not read nameplate. Pump base plate is deflected down about 1/4 in. at the center.	2
134	Pughsville Road	Pump 1	Pump	2	3	Good Vibrating Cavitating	Continue Scheduled Maintenance Activities	Hard to read nameplate. Pump base plate is deflected about 1/4 in. at the center. While at the station, the pump was running at 30-35% of max rpm.	2
134	Pughsville Road	Pump 2	Pump	2	3	Good Vibrating Cavitating	Continue Scheduled Maintenance Activities	Hard to read nameplate. Pump base plate is deflected about 1/4 in. at the center	2
134	Pughsville Road	Pump 3	Pump	2	3	Good Vibrating Cavitating	Continue Scheduled Maintenance Activities	Hard to read nameplate. Pump base plate is deflected about 1/4 in. at the center	2
134	Pughsville Road	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
134	Pughsville Road	Pump 5	Well Pump	2	1	Good	No Immediate Action Required	No Comment	1
134	Pughsville Road	Pump 6	Grinder Pump System	2	1	Good	No Immediate Action Required	Grinder pump for station toilet.	1

**Table 134-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
134	Pughsville Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation. Check valve springs are slow to close valves. They are still open when the motors stop spinning.	1
134	Pughsville Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Check Valve Pump 3	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
134	Pughsville Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 134-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
134	Pughsville Road	Electrical Equipment	Electrical Equipment	2	2	Panel Corroded	No Immediate Action Required	Well pump disconnect was corroded, had an open knockout and is an obsolete design.	1
134	Pughsville Road	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
134	Pughsville Road	Control Panel	Control Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
134	Pughsville Road	VFD	VFD	2	1	None to Report	No Immediate Action Required	No Comment	1
134	Pughsville Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
134	Pughsville Road	SCADA	SCADA	2	1	No panel door grounding wire Terminal strip not labeled	No Immediate Action Required	No Comment	1
134	Pughsville Road	Transfer Switch	Transfer Switch	2	1	Good Switch Corroded	No Immediate Action Required	Corrosion on ground lug.	1
134	Pughsville Road	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
134	Pughsville Road	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
134	Pughsville Road	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
134	Pughsville Road	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
134	Pughsville Road	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Drawdown Testing

Not applicable.

### Pughsville Assets of Interest

None.

### Pughsville Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment Properly Grounded:
  - Control panel & MMPS are not bonded to the station grounding system

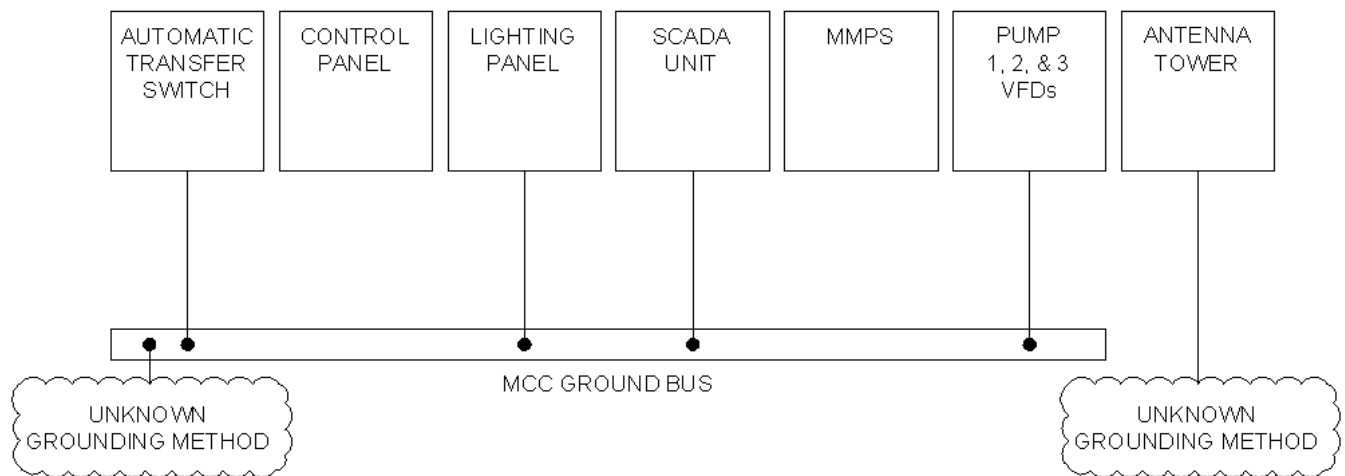


Figure 134-3. Pughsville Grounding System

### Pughsville Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires



- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

### **Pughsville Dual Power Feed/Lightning Strike Power Failures**

No history of failure.

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## PS 135 Suffolk Pump Station

### Suffolk Facility Description

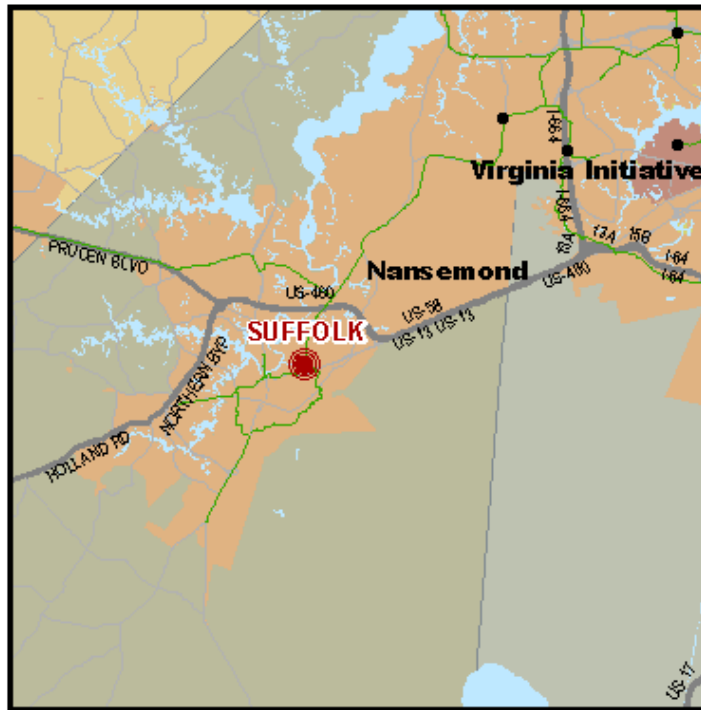


Figure 135-1. Suffolk PS Location Map



Figure 135-2. Suffolk PS

<b>Table 135-1. Suffolk PS</b>	
Pumping Facility Number	135
Date of Initial Inspection	7/3/2008
Date of Update Inspection	6/7/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/7/2011
Date of Construction	1979
Address	1136 Sanders Drive, Suffolk
Receiving Facility	Nansemond Treatment Plant
Design Head (Feet)	80 ft.
Firm Pumping Capacity (GPM)	4700 GPM
Total Pumping Capacity (GPM)	9400 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Yeoman
Pump Nameplate Capacity	4700 GPM
Standby Pump(s) present during inspection	12" Godwin CD300M
Motor Manufacturer	Continental Electric
Motor Nameplate Power (HP)	150
Generator Power (KW)	250

### Suffolk Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 135-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
135	Suffolk	Building	Building	2	1	Good	No Immediate Action Required	Recently replaced roof. Ceiling of dry well has exposed rebar (missing concrete) in 2 places.	1
135	Suffolk	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Motor room fan has recently had new belts installed. The pump room fan has recently had a new motor installed. The station has two rooms which are no longer in service so two fans are out of service.	1
135	Suffolk	Wet well	Wet well	3	3	Concrete Spalling	Continue Scheduled Maintenance Activities	Heavy grease loading. Spalling is minor and is evident at the inlet flumes and intermediate deck only. 5/2012: HRSD PM inspection on 03/21/2012 indicates no major changes from the 2008 wet well data.	2
135	Suffolk	Motor 1	Motor and Controller	3	1	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M.	2
135	Suffolk	Motor 2	Motor and Controller	3	1	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M.	2
135	Suffolk	Pump 1	Pump	3	2	Vibrating	Continue Scheduled Maintenance Activities	Pump #1. No name plate.	2
135	Suffolk	Pump 2	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Pump #2. Could not verify with name plate. Shaft deflection evident from sound produced.	2
135	Suffolk	Pump	Electrolyte Circulation Pump	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Pump	Electrolyte Circulation Pump	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Pump	Well Pump	2	1	Good	No Immediate Action Required	No Comment	1

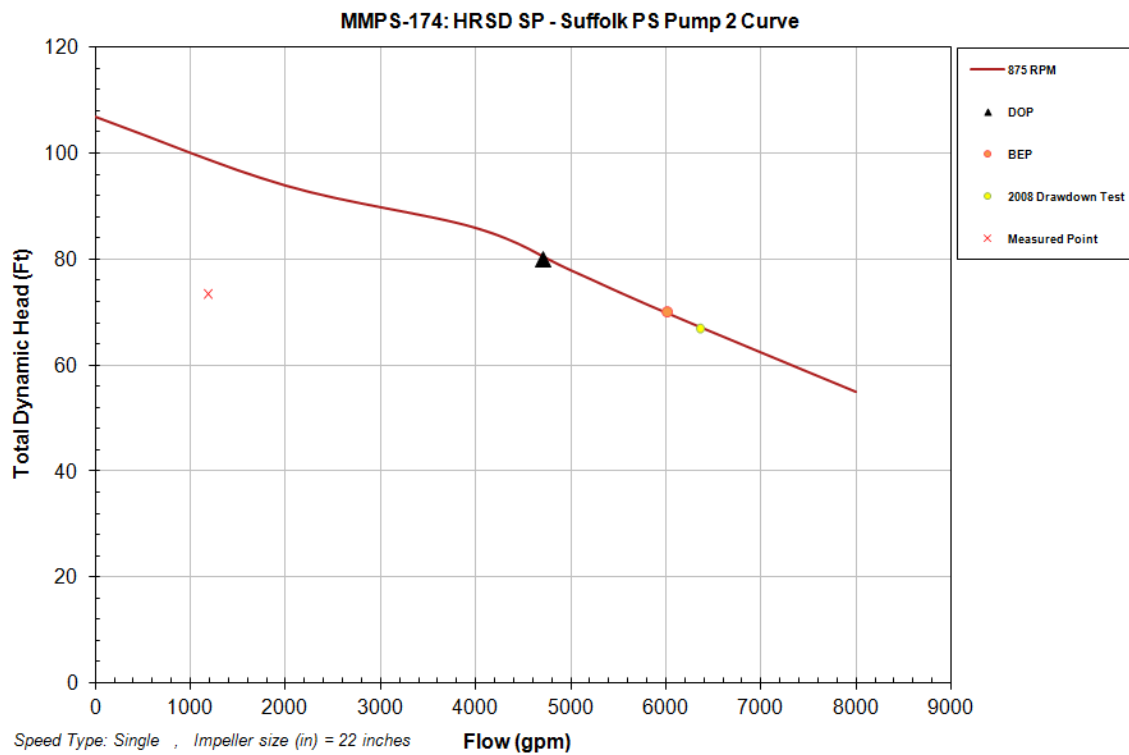
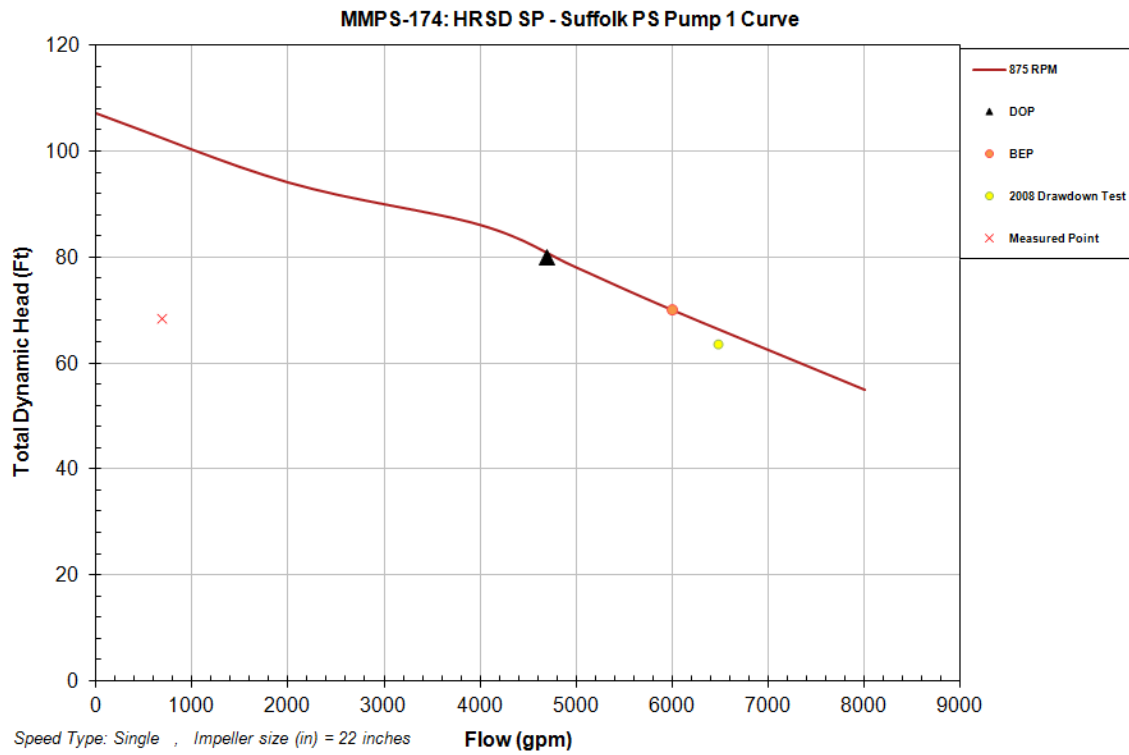
**Table 135-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
135	Suffolk	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation	1
135	Suffolk	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
135	Suffolk	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
135	Suffolk	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
135	Suffolk	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
135	Suffolk	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
135	Suffolk	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
135	Suffolk	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete Dust Inside Panel	Continue Scheduled Maintenance Activities	Unable to open the larger equipment panels.	2
135	Suffolk	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Flomatcher	2
135	Suffolk	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed	Continue Scheduled Maintenance Activities	Equipment appears to be old.	2
135	Suffolk	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

**Table 135-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
135	Suffolk	SCADA	SCADA	2	1	No panel door grounding wire Terminal strip not labeled	No Immediate Action Required	No Comment	1
135	Suffolk	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
135	Suffolk	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





Suffolk PS uses variable speed Flomatcher pump controls which do not give a remote indication of pump shaft speed. The plotted curve is for the maximum pump shaft speed and the measured point gives an indication of the pumps normal operating range rather than pumping capacity.

### Suffolk Assets of Interest

The station uses Flomatcher pump controllers. This station is scheduled for improvements and / or replacement in the Interim System Improvements.



Figure 135-3. Suffolk PS Flomatcher

### Suffolk Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS & motor starters are not bonded to the station grounding system

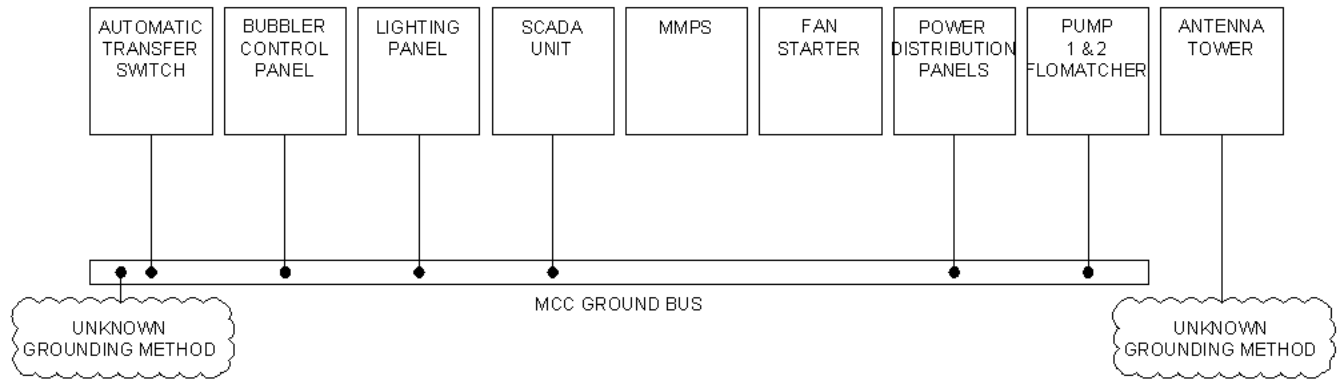


Figure 135-4. Suffolk Grounding System

### Suffolk Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 137 Bowers Hill Pressure Reducing Station

### Bowers Hill Facility Description

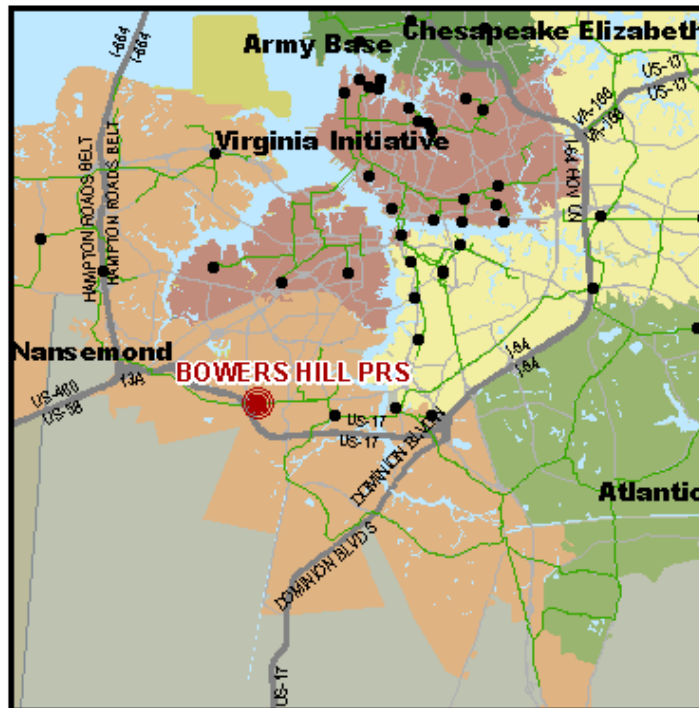


Figure 137-1. Bowers Hill PRS Location Map



Figure 137-2. Bowers Hill PRS

**Table 137-1. Bowers Hill PRS**

<b>Pumping Facility Number</b>	<b>137</b>
<b>Date of Initial Inspection</b>	<b>7/3/2008</b>
<b>Date of Update Inspection</b>	<b>6/7/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/8/2011</b>
<b>Date of Construction</b>	<b>1977</b>
<b>Address</b>	<b>3588 South Military Hwy, Chesapeake</b>
<b>Receiving Facility</b>	<b>Nansemond Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>65</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>9800</b>
<b>Total Pumping Capacity (GPM)</b>	<b>14700</b>
<b>Number of Pumps</b>	<b>3</b>
<b>Pump Type</b>	<b>Dry-pit Submersible</b>
<b>Pump Manufacturer</b>	<b>Flygt</b>
<b>Pump Nameplate Capacity</b>	<b>4900 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Flygt</b>
<b>Motor Nameplate Power (HP)</b>	<b>200</b>
<b>Generator Power (KW)</b>	<b>500</b>

### **Bowers Hill Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

**Table 137-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
137	Bowers Hill	Building	Building	2	1	Good	No Immediate Action Required	One downspout is completely detached from the rear wall. The rest of the downspouts are nearly detached. Four ton crane.	1
137	Bowers Hill	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Motor 1	Wastewater Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Motor 2	Wastewater Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Motor 3	Wastewater Pump Motor and Controller	1	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out for 2011 inspection - no performance rating.	2
137	Bowers Hill	Pump 1	Pump	1	1	Good	No Immediate Action Required	New pump, no nameplate.	1
137	Bowers Hill	Pump 2	Pump	1	1	Good	No Immediate Action Required	New pump, no nameplate. Discharge pressure 18 psi.	1
137	Bowers Hill	Pump 3	Pump	1	See Comments	Good	Continue Scheduled Maintenance Activities	New pump, no nameplate. Pump locked out for 2011 inspection - no performance rating.	2
137	Bowers Hill	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	Sits tilted in the well instead of upright.	1
137	Bowers Hill	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Bypass leg's check valve has been removed to allow reverse flow through force main. 6/11: HRSD inspections indicate no problems with isolation valve operation. Check valve #1 has a slight audible slam on closure.	1

Table 137-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
137	Bowers Hill	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
137	Bowers Hill	Electrical Equipment	Electrical Equipment	2	1	Good Dust Inside Panel	No Immediate Action Required	Corrosion forming on MCC ground bus.	1
137	Bowers Hill	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	Field instrumentation excess cable is not being properly stored.	1

**Table 137-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
137	Bowers Hill	Control Panel	Control Panel	2	1	None to Report	No Immediate Action Required	No Comment	1
137	Bowers Hill	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
137	Bowers Hill	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
137	Bowers Hill	SCADA	SCADA	2	1	No panel door grounding wire	No Immediate Action Required	No Comment	1
137	Bowers Hill	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
137	Bowers Hill	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
137	Bowers Hill	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing

Not Applicable

### Bowers Hill Assets of Interest

None.

### Bowers Hill Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler is not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system

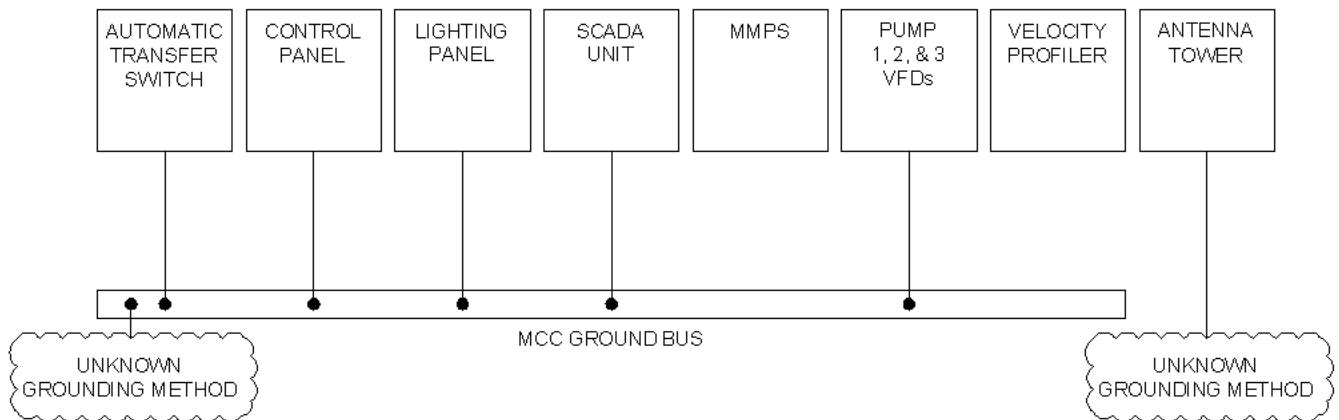


Figure 137-3. Bowers Hill Grounding System

### Bowers Hill Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn



- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PRS 138 Deep Creek Pressure Reducing Station

### Deep Creek Facility Description

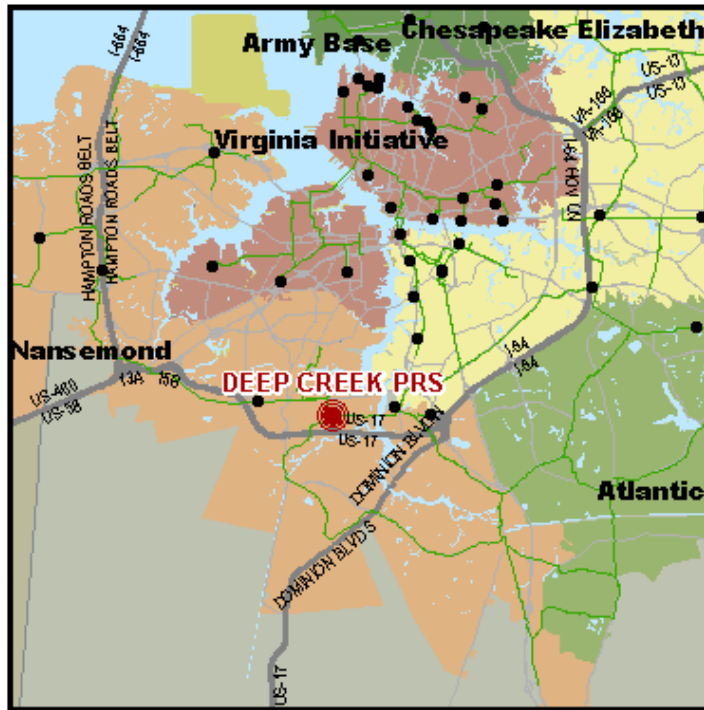


Figure 138-1. Deep Creek PRS Location Map



Figure 138-2. Deep Creek PRS

<b>Table 138-1. Deep Creek PRS</b>	
Pumping Facility Number	138
Date of Initial Inspection	7/3/2008
Date of Update Inspection	6/9/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/8/2011
Date of Construction	1977
Address	1221 Shell Road, Chesapeake
Receiving Facility	Nansemond Treatment Plant
Design Head (Feet)	65
Firm Pumping Capacity (GPM)	9800
Total Pumping Capacity (GPM)	14700
Number of Pumps	3
Pump Type	Direct-coupled centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	4900
Standby Pump(s) present during inspection	None
Motor Manufacturer	Marathon Electric
Motor Nameplate Power (HP)	125
Generator Power (KW)	500

### Deep Creek Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 138-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
138	Deep Creek	Building	Building	2	1	Good	No Immediate Action Required	There is an unused bypass pump slab in the yard.	1
138	Deep Creek	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
138	Deep Creek	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Motor from Bowers Hill PRS.	1
138	Deep Creek	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Motor from Bowers Hill PRS.	1
138	Deep Creek	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Motor from Bowers Hill PRS.	1
138	Deep Creek	Pump 1	Pump	2	1	Good	No Immediate Action Required	Old Bowers Hill pump. Pump mounting frame cross brace is buckled.	1
138	Deep Creek	Pump 2	Pump	2	1	Good	No Immediate Action Required	Could not verify name plate. Old Bowers Hill pump.	1
138	Deep Creek	Pump 3	Pump	2	1	Good	No Immediate Action Required	Could not verify name plate. Old Bowers Hill pump. Pump produces faint noise.	1
138	Deep Creek	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
138	Deep Creek	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation. Check valves #1 and #3 have a slight audible slam on closure. There are five bypass valves installed - good condition. 1 valve missing 3 bolts.	1
138	Deep Creek	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 138-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
138	Deep Creek	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Check Valve Pump 3	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
138	Deep Creek	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
138	Deep Creek	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Instrument lighting malfunctioning. Field instrumentation excess cable is not being properly stored.	2
138	Deep Creek	Control Panel	Control Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
138	Deep Creek	VFD	VFD	2	1	None to Report	No Immediate Action Required	No Comment	1
138	Deep Creek	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
138	Deep Creek	SCADA	SCADA	2	1	None to Report	No Immediate Action Required	No panel door grounding wire. Terminal strip not labeled.	1
138	Deep Creek	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
138	Deep Creek	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
138	Deep Creek	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1

**Table 138-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
138	Deep Creek	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
138	Deep Creek	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
138	Deep Creek	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level. There are 3 observation wells drilled near the fuel tank.	1

### Draw-Down Testing

Not Applicable

### Deep Creek Assets of Interest

None.

### Deep Creek Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system

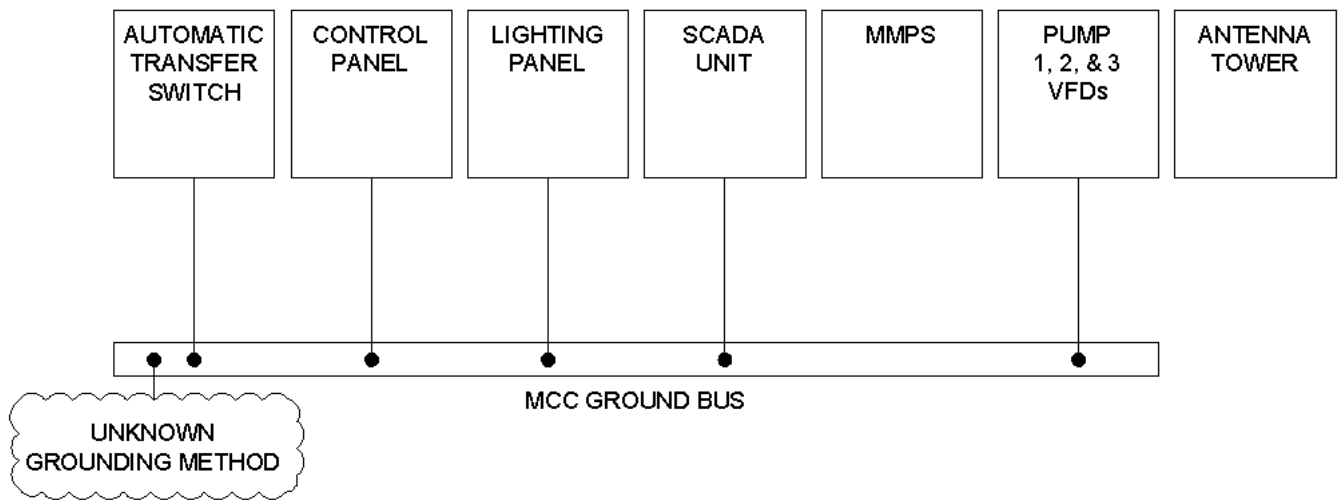


Figure 138-3. Deep Creek Grounding System

### Deep Creek Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel



- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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<b>Table 139-1. Quail Ave PRS</b>	
Pumping Facility Number	139
Date of Initial Inspection	6/25/2008
Date of Update Inspection	6/20/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/20/2011
Date of Construction	1978
Address	822 Quail Avenue, Chesapeake
Receiving Facility	Atlantic Treatment Plant
Design Head (Feet)	95 ft.
Firm Pumping Capacity (GPM)	12000 GPM
Total Pumping Capacity (GPM)	16000 GPM
Number of Pumps	4
Pump Type	Direct-coupled Centrifugal
Pump Manufacturer	Aurora Pump
Pump Nameplate Capacity	4000 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Siemens
Motor Nameplate Power (HP)	150
Generator Power (KW)	400

### Quail Ave PRS Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Quail Ave pressure reducing station was taken out of operation during the 2011 inspections so performance scores were not given. The data presented is based on visual observations of equipment. Any performance related comments for assets without performance scores are from the 2008 inspection data and were not verified due to equipment being tagged out.

**Table 139-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
139	Quail Avenue PRS	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	Motor 1	Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Pump disconnected. Locked out.	2
139	Quail Avenue PRS	Motor 2	Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out.	2
139	Quail Avenue PRS	Motor 3	Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out.	2
139	Quail Avenue PRS	Motor 4	Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out.	2
139	Quail Avenue PRS	Pump 1	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Pump disconnected.	2
139	Quail Avenue PRS	Pump 2	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out	2
139	Quail Avenue PRS	Pump 3	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out	2
139	Quail Avenue PRS	Pump 4	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out	2
139	Quail Avenue PRS	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valves not assessed for performance because station not in service. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1

Table 139-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
139	Quail Avenue PRS	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
139	Quail Avenue PRS	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
139	Quail Avenue PRS	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
139	Quail Avenue PRS	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
139	Quail Avenue PRS	Check Valve Pump 1	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
139	Quail Avenue PRS	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
139	Quail Avenue PRS	Check Valve Pump 3	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
139	Quail Avenue PRS	Check Valve Pump 4	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
139	Quail Avenue PRS	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
139	Quail Avenue PRS	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
139	Quail Avenue PRS	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 139-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
139	Quail Avenue PRS	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
139	Quail Avenue PRS	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete	Continue Scheduled Maintenance Activities	Wiring will allow only 3 of 4 pumps to run regardless of power source. MCC & ATS are aging.	2
139	Quail Avenue PRS	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	Control Panel	Control Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	MMPS	MMPS	1	1	Wires being pinched in the door	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	Transfer Switch	Transfer Switch	3	2	Good	Continue Scheduled Maintenance Activities	Corrosion on ground bus	2
139	Quail Avenue PRS	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1

**Table 139-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
139	Quail Avenue PRS	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
139	Quail Avenue PRS	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1



### Draw-Down Testing

Not Applicable

### Quail Ave PRS Assets of Interest

None.

### Quail Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler is not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS & control panel are not bonded to the station grounding system

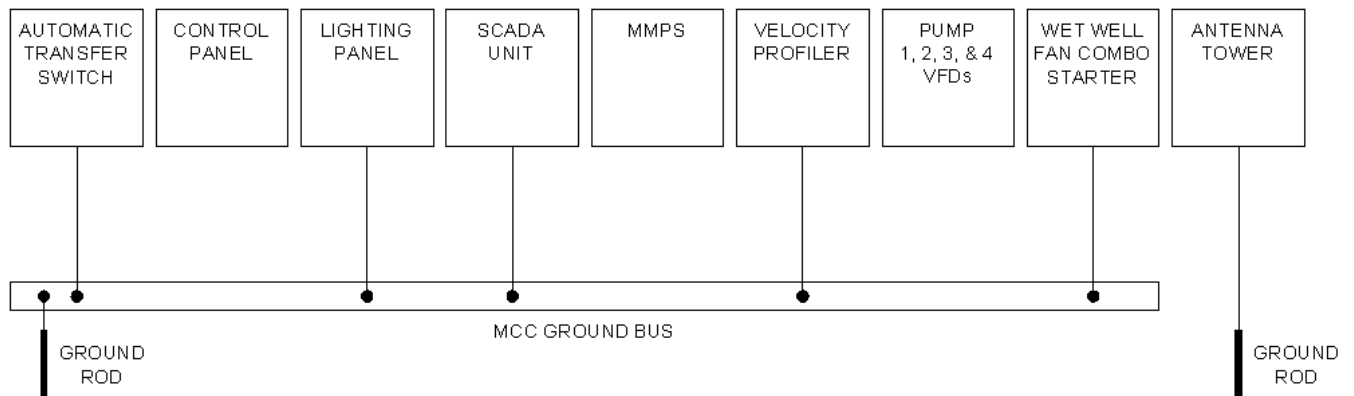


Figure 139-3. Quail Ave PRS Grounding System

### Quail Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires

- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PRS 140 Atlantic Pressure Reducing Station

### Atlantic PRS Facility Description



Figure 140-1. Atlantic PRS Location Map



Figure 140-2. Atlantic PRS

<b>Table 140-1. Atlantic PRS</b>	
Pumping Facility Number	140
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/24/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/20/2011
Date of Construction	1976
Address	1085 Old Dam Neck Road, Virginia Beach
Receiving Facility	Atlantic Treatment Plant
Design Head (Feet)	66 ft.
Firm Pumping Capacity (GPM)	50100 GPM
Total Pumping Capacity (GPM)	66800 GPM
Number of Pumps	4
Pump Type	Centrifugal
Pump Manufacturer	Worthington
Pump Nameplate Capacity	16700 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Siemens
Motor Nameplate Power (HP)	350
Generator Power (KW)	1500

### Atlantic PRS Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Atlantic Ave pressure reducing station was taken out of operation during the 2011 inspections so performance scores were not given. The data presented is based on visual observations of equipment. Any performance related comments for assets without performance scores are from the 2008 inspection data and were not verified due to equipment being tagged out.

Table 140-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
140	Atlantic	Building	Building	2	1	Good	No Immediate Action Required	5 ton crane	1
140	Atlantic	HVAC System	HVAC System	2	See Comments	Good	Continue Scheduled Maintenance Activities	Ventilation not run because station is locked out.	2
140	Atlantic	Motor 1	Wastewater Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out since 2/2011 - no performance score given.	2
140	Atlantic	Motor 2	Wastewater Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out since 2/2011 - no performance score given.	2
140	Atlantic	Motor 3	Wastewater Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out since 2/2011 - no performance score given.	2
140	Atlantic	Motor 4	Wastewater Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Locked out since 2/2011 - no performance score given.	2
140	Atlantic	Motor 5	Grinder Pump System	2	1	Good	No Immediate Action Required	Pump system used for bathroom and sump onsite.	1
140	Atlantic	Motor 6	Grinder Pump System	2	1	Good	No Immediate Action Required	Pump system used for bathroom and sump onsite.	1
140	Atlantic	Pump 1	Pump	3	See Comments	Cavitating	Continue Scheduled Maintenance Activities	Unable to verify 2008 observations: Pump made noises. Locked out since 2/2011 - no performance score given.	2
140	Atlantic	Pump 2	Pump	3	See Comments	Cavitating	Continue Scheduled Maintenance Activities	Unable to verify 2008 observations: Pump made noises. Locked out since 2/2011 - no performance score given.	2
140	Atlantic	Pump 3	Pump	4	See Comments	None to Report	Continue Scheduled Maintenance Activities	Unable to verify 2008 observations: Pump made noises. Locked out since 2/2011 - no performance score given.	2
140	Atlantic	Pump 4	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	No score from 2008. Visual Condition only Locked out since 2/2011 - no performance score given.	2

**Table 140-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
140	Atlantic	Pump	Grinder Sewage Pump	2	1	None to Report	No Immediate Action Required	Grinder pump	1
140	Atlantic	Pump	Grinder Sewage Pump	2	1	None to Report	No Immediate Action Required	Grinder pump	1
140	Atlantic	Pump	Sump Pump 1	2	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Pump	Sump Pump 2	2	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	#3 discharge is dripping and rusting. Pressure sensor valve leaking. Check valve performance not assessed because station locked out. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
140	Atlantic	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
140	Atlantic	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
140	Atlantic	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
140	Atlantic	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
140	Atlantic	Check Valve Pump 1	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
140	Atlantic	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2

Table 140-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
140	Atlantic	Check Valve Pump 3	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
140	Atlantic	Check Valve Pump 4	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
140	Atlantic	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
140	Atlantic	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
140	Atlantic	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
140	Atlantic	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
140	Atlantic	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Control Panel	Control Panel	1	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
140	Atlantic	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
140	Atlantic	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

**Table 140-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
140	Atlantic	SCADA	SCADA	2	1	No panel door grounding wire Terminal strip not labeled Uncapped wires loose in the panel	No Immediate Action Required	No Comment	1
140	Atlantic	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
140	Atlantic	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
140	Atlantic	Tank 1	Fuel Day Tank	1	1	Good	No Immediate Action Required	No Comment	1



### Draw-Down Testing

Not Applicable

### Atlantic PRS Assets of Interest

None.

### Atlantic PRS Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler & control panel are not protected by a surge suppressor
- Equipment Properly Grounded:
  - MMPS is not bonded to the station grounding system

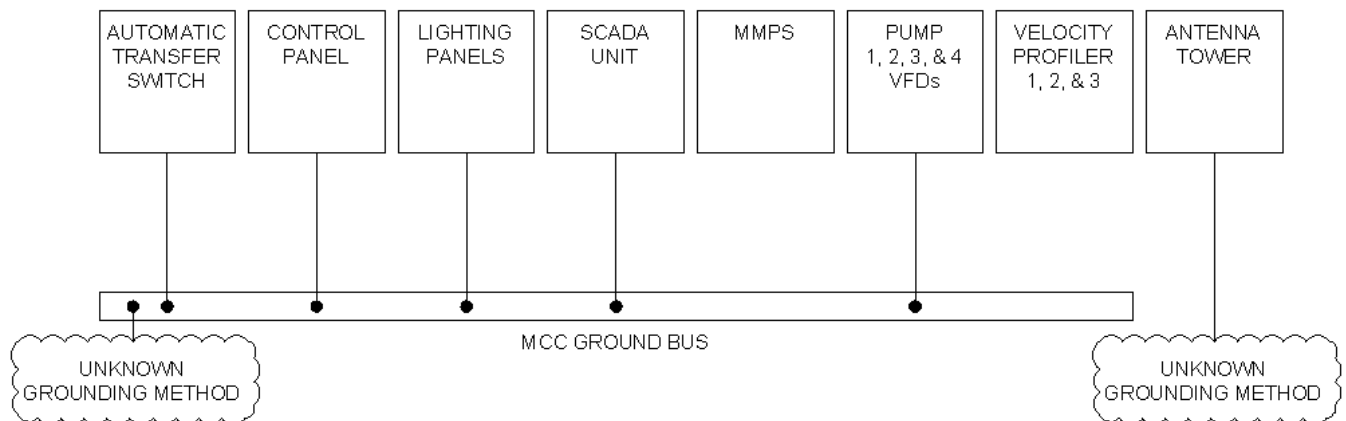


Figure 140-3. Atlantic Ave Grounding System

### Atlantic PRS Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires

- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 141 Hanover Ave Pump Station

### Hanover Ave Facility Description



Figure 141-1. Hanover Ave PS Location Map



Figure 141-2. Hanover Ave PS

<b>Table 141-1. Hanover Ave PS</b>	
Pumping Facility Number	141
Date of Initial Inspection	6/23/2008
Date of Update Inspection	6/21/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	6/23/2011
Date of Construction	1953
Address	900 Hanover Avenue, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	40 ft.
Firm Pumping Capacity (GPM)	300 GPM
Total Pumping Capacity (GPM)	600 GPM
Number of Pumps	2
Pump Type	Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	300 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric
Motor Nameplate Power (HP)	8
Generator Power (KW)	None

### Hanover Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

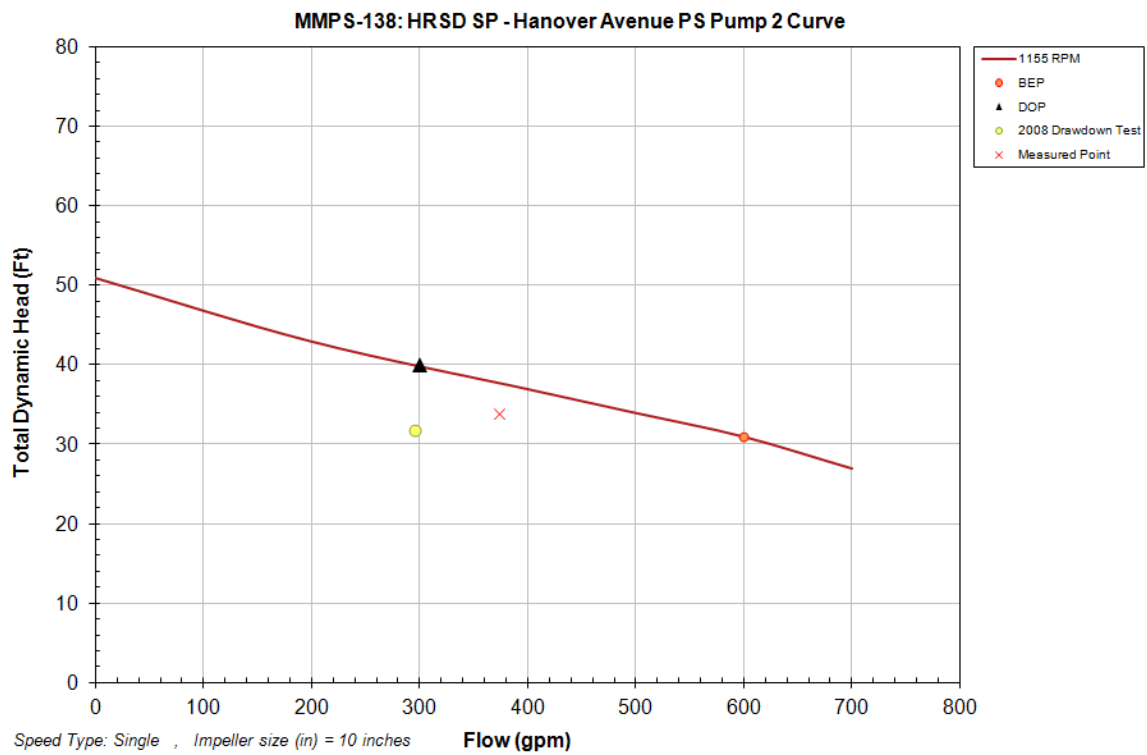
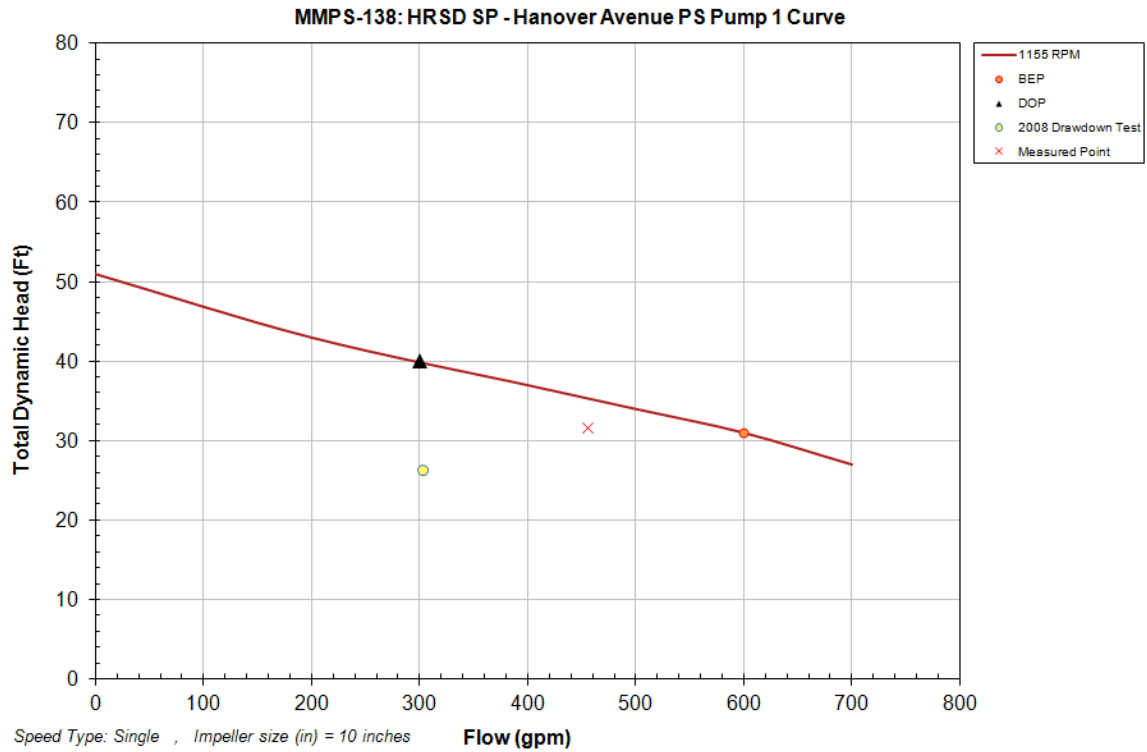
**Table 141-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
141	Hanover Avenue	Wet well	Wet well	4	1	Concrete Spalling	Schedule Corrective Action	Pump 2 rails corroded badly compared to pump 1. Influent has a high drop next to pump 2 rails. Wet well has no ventilation lines. 5/2012: HRSD PM inspection on 01/26/2012 indicates no major changes from the 2008 wet well data.	3
141	Hanover Avenue	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Pump 1	Pump	2	1	Good	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Pump 2	Pump	2	1	Good	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
141	Hanover Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
141	Hanover Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
141	Hanover Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
141	Hanover Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 141-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
141	Hanover Avenue	Electrical Equipment	Electrical Equipment	2	1	Good Panel Corroded Dust Inside Panel	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Bubbler Panel	Bubbler Panel	2	1	None to Report	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
141	Hanover Avenue	MMPS	MMPS	1	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
141	Hanover Avenue	SCADA	SCADA	2	1	None to Report	No Immediate Action Required	No Comment	1
141	Hanover Avenue	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Panel is starting to corrode	1

## Draw-Down Testing





## Hanover Ave Assets of Interest

The wet well is deteriorating.



Figure 141-3. Hanover Ave Wet Well

### Hanover Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - MMPS is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system



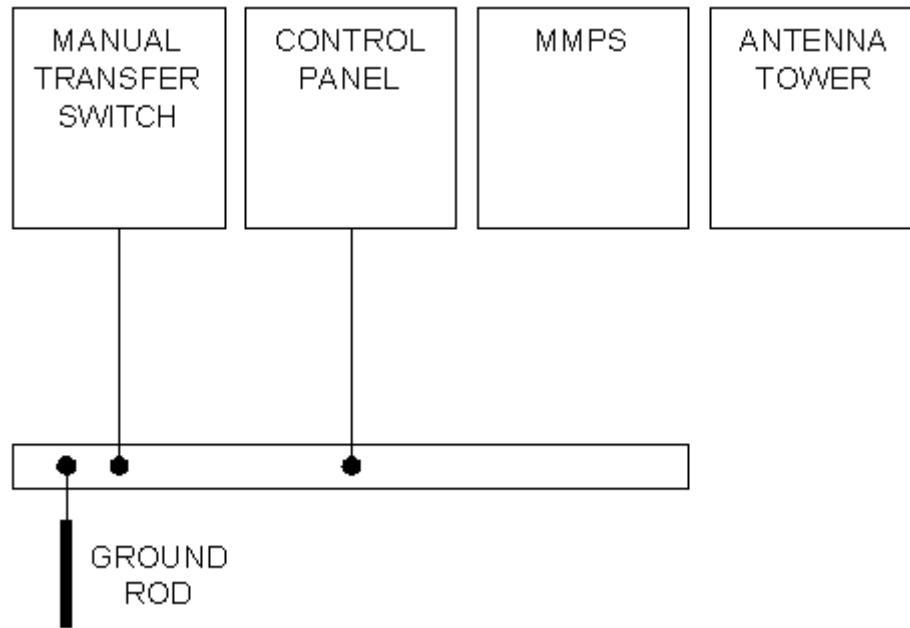


Figure 141-4. Hanover Ave Grounding System

### Hanover Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided

- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 142 Jamestown Crescent Pump Station

### Jamestown Crescent Facility Description



Figure 142-1. Jamestown Crescent PS Location Map



Figure 142-2. Jamestown Crescent PS

**Table 142-1. Jamestown Crescent PS**

<b>Pumping Facility Number</b>	<b>142</b>
<b>Date of Initial Inspection</b>	<b>6/23/2008</b>
<b>Date of Update Inspection</b>	<b>6/21/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/23/2011</b>
<b>Date of Construction</b>	<b>1953</b>
<b>Address</b>	<b>858 Jamestown Crescent, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>40 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>300 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>600 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Submersible</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>300 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Motor Nameplate Power (HP)</b>	<b>8</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Jamestown Crescent Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

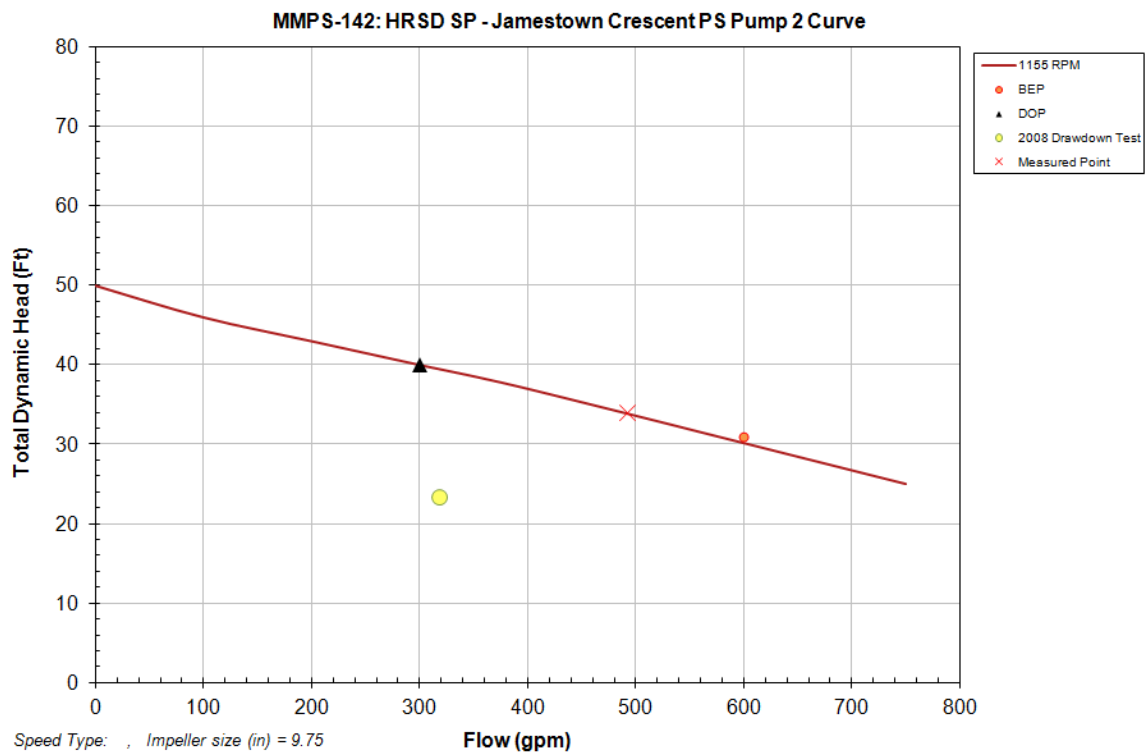
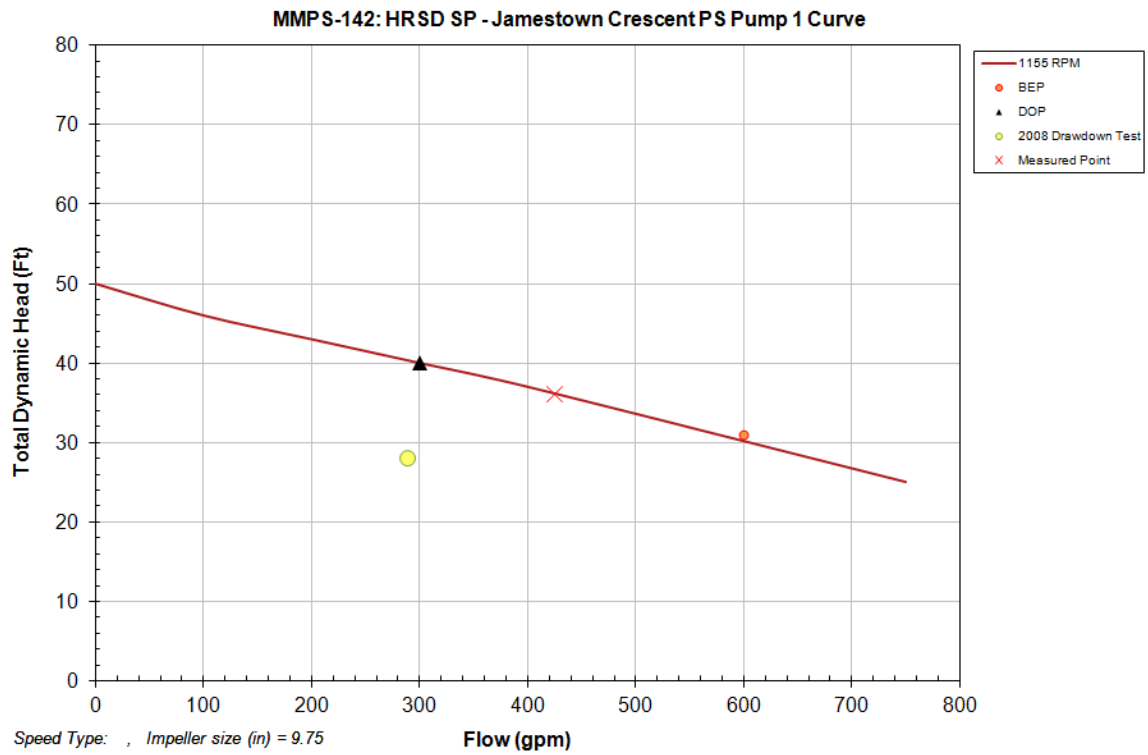
Table 142-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
142	Jamestown Crescent	Wet well	Wet well	4	1	None	Schedule Corrective Action	New guide rails were installed 01/20/2012. 5/2012: HRSD PM inspection on 01/26/2012 no major changes since 2008 wet well data.	3
142	Jamestown Crescent	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
142	Jamestown Crescent	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
142	Jamestown Crescent	Pump 1	Pump	2	1	Good	No Immediate Action Required	Pump mounting rails corroded. (Replaced 01/20/2012)	1
142	Jamestown Crescent	Pump 2	Pump	2	1	Good	No Immediate Action Required	Pump mounting rails corroded. (Replaced 01/20/2012)	1
142	Jamestown Crescent	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
142	Jamestown Crescent	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
142	Jamestown Crescent	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
142	Jamestown Crescent	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
142	Jamestown Crescent	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
142	Jamestown Crescent	Electrical Equipment	Electrical Equipment	2	2	Good Dust Inside Panel	No Immediate Action Required	Panel is packed tight. Terminals not labeled. Hole in the panel.	1

**Table 142-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
142	Jamestown Crescent	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
142	Jamestown Crescent	Bubbler Panel	Bubbler Panel	2	1	None to Report	No Immediate Action Required	No Comment	1
142	Jamestown Crescent	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
142	Jamestown Crescent	MMPS	MMPS	1	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
142	Jamestown Crescent	SCADA	SCADA	2	1	No panel door grounding wire. Coax is not in a conduit.	No Immediate Action Required	No Comment	1
142	Jamestown Crescent	Transfer Switch	Transfer Switch	2	1	Good Poor Housekeeping	No Immediate Action Required	No Comment	1

### Draw-Down Testing



### Jamestown Crescent Assets of Interest

The wet well is deteriorating.



Figure 142-3. Jamestown Crescent Wet Well

### Jamestown Crescent Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment properly Grounded:
  - MMPS, SCADA Unit, starter Panel, & UPS panel are not bonded to the station grounding system



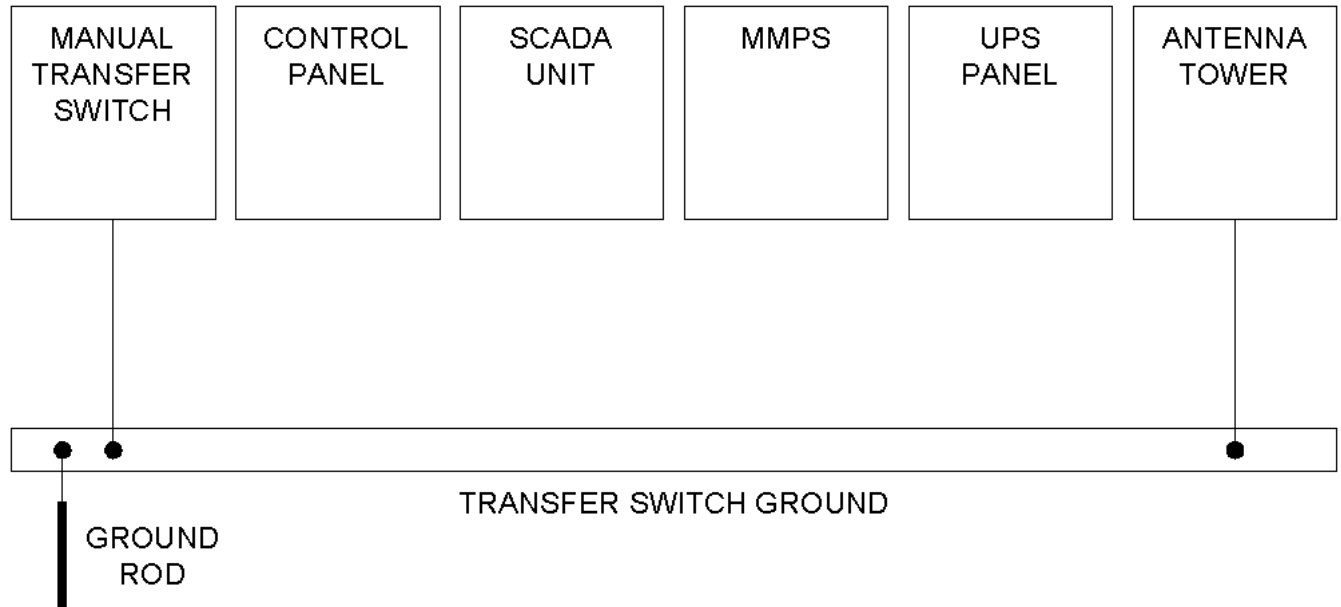


Figure 142-4. Jamestown Crescent Grounding System

**Jamestown Crescent Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided

- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PRS 143 Shipps Corner Pressure Reducing Station

### Shipps Corner Facility Description



Figure 143-1. Shipps Corner Location Map



Figure 143-2. Shipps Corner

**Table 143-1. Shippo Corner PRS**

<b>Pumping Facility Number</b>	<b>143</b>
<b>Date of Initial Inspection</b>	<b>7/1/2008</b>
<b>Date of Update Inspection</b>	<b>6/24/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>7/21/2011</b>
<b>Date of Construction</b>	<b>1984</b>
<b>Address</b>	<b>1423 London Bridge Blvd, Virginia Beach</b>
<b>Receiving Facility</b>	<b>Atlantic Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>63 ft.</b>
<b>Firm Pumping Capacity (GPM)*</b>	<b>27750 GPM</b>
<b>Total Pumping Capacity (GPM)*</b>	<b>37000 GPM</b>
<b>Number of Pumps*</b>	<b>4</b>
<b>Pump Type</b>	<b>Direct-coupled Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Allis Chalmers</b>
<b>Pump Nameplate Capacity*</b>	<b>9250 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>2 x 12" CD300M 1 x 18" Godwin CD500M</b>
<b>Motor Manufacturer</b>	<b>Continental Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>200</b>
<b>Generator Power (KW)</b>	<b>795</b>

\*Two of four pumps have been removed from service and Engine-Driven standby pumps have been piped in.

## Shippo Corner Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

During the 2011 visit to Shippo Corner pump station, dry weather conditions made operation of the pumps unfeasible. Any performance related comments are from the 2008 inspection and could not be verified.

Two of the Shippo Corner pumps (#1 and #2) have been removed from the station. The existing piping, including the isolation and check valves, from the two original pumps was used to connect to fused HDPE pipe from three diesel driven pumps.

Table 143-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
143	Shipps Corner	Building	Building	2	1	Good	No Immediate Action Required	There is a 36" check valve in a yard vault that appears relatively new. 3 Godwin pumps (CD500M, 2 x CD300M) One of the 12" Godwin pumps and the 18" Godwin pump appear to have small fuel leaks.	1
143	Shipps Corner	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
143	Shipps Corner	Motor 3	Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Pump not run for 2011 inspection because of low flow conditions.	2
143	Shipps Corner	Motor 4	Motor and Controller	3	See Comments	None to Report	Continue Scheduled Maintenance Activities	Flomatcher creates higher than expected O & M. Cooling jackets prone to corrosion and clogging due to electrolytes. Pump not run for 2011 inspection because of low flow conditions.	2
143	Shipps Corner	Pump	Well Pump	2	1	None to Report	No Immediate Action Required	No Comment	1
143	Shipps Corner	Pump 3	Pump	3	See Comments	Cavitating	Continue Scheduled Maintenance Activities	Cycles through times of cavitation as pressure dips toward 7 psi setting. Original setpoint was 14psi but was lowered to increase run times. Cavitation likely associated with suction pressure. No affect on overall rating. Not run during 2011 inspection.	2

**Table 143-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
143	Shippo Corner	Pump 4	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Pump made noises. - not enough to affect rating. Not run during 2011 inspection due to dry weather flows.	2
143	Shippo Corner	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Part of grinder pump system for station bathroom.	1
143	Shippo Corner	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Part of grinder pump system for station bathroom.	1
143	Shippo Corner	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Suction valve #4 leaking. Pumps not run for 2011 assessment due to dry weather. Check valves have several shop made weights hanging from them to keep flow from going through pumps while they are off. 6/11: HRSD inspections- Perf: good	1
143	Shippo Corner	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
143	Shippo Corner	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
143	Shippo Corner	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
143	Shippo Corner	Suction Isolation Valve Pump 4	Suction Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
143	Shippo Corner	Check Valve Pump 1	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
143	Shippo Corner	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
143	Shippo Corner	Check Valve Pump 3	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2

Table 143-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
143	Shippo Corner	Check Valve Pump 4	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
143	Shippo Corner	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
143	Shippo Corner	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
143	Shippo Corner	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
143	Shippo Corner	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
143	Shippo Corner	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete Dust Inside Panel	Continue Scheduled Maintenance Activities	No Comment	2
143	Shippo Corner	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
143	Shippo Corner	Control Panel	Control Panel	4	2	Obsolete	Schedule Corrective Action	Equipment is old & obsolete Upgrade control panel.	3
143	Shippo Corner	FLOmatcher	FLOmatcher	3	2	None to Report	Continue Scheduled Maintenance Activities	Equipment is maintained but is old and should be considered for replacement.	2
143	Shippo Corner	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
143	Shippo Corner	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
143	Shippo Corner	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
143	Shippo Corner	Transfer Switch	Transfer Switch	2	2	Good	No Immediate Action Required	Panel door should be considered for replacement.	1
143	Shippo Corner	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1

**Table 143-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
143	Shippo Corner	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
143	Shippo Corner	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
143	Shippo Corner	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
143	Shippo Corner	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1



## Draw-Down Testing

Not Applicable

## Shipp's Corner Assets of Interest

There are three diesel-driven pumps onsite that are hard piped into the two spots where station pumps #1 and #2 were removed. The station uses flomatcher pump controllers.



Figure 143-3. Shipp's Corner HDPE Diesel-Driven Pump Piping



**Figure 143-4. Shippo Corner Flomatcher**

The door panel to the automatic transfer switch requires action.



**Figure 143-5. Transfer Switch**

### Shippo Corner Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler & control panel are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS & SCADA Unit are not bonded to the station grounding system
  - Replace MCC ground wire, it is corroded

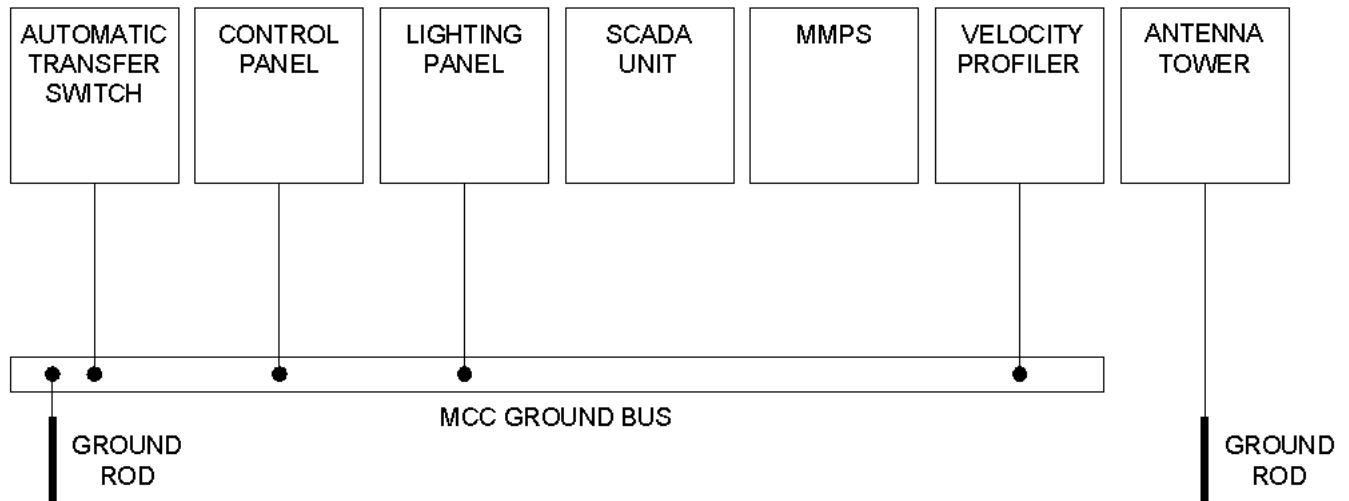


Figure 143-6. Shippo Corner Grounding System

### Shippo Corner Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions

- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 144 Elmhurst Ln Pump Station

### Elmhurst Ln Facility Description

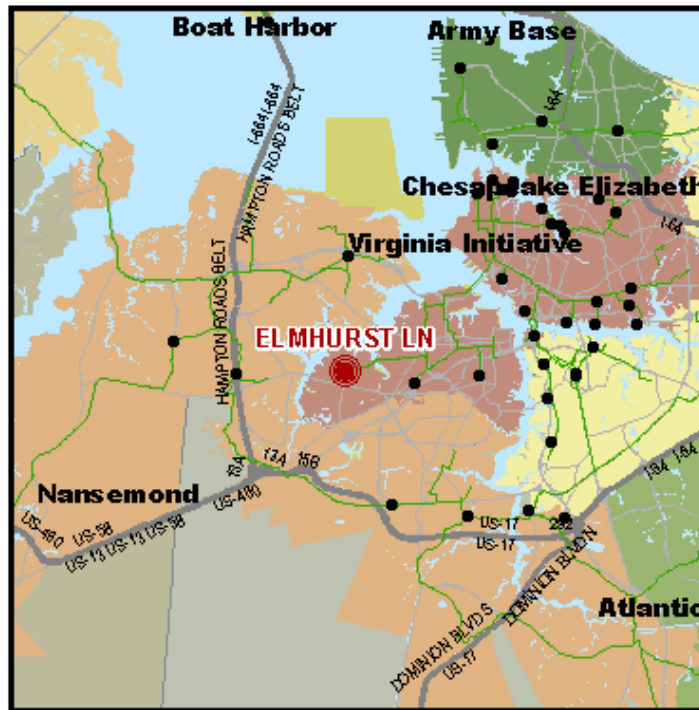


Figure 144-1. Elmhurst Ln PS Location Map



Figure 144-2. Elmhurst Ln PS

<b>Table 144-1. Elmhurst Lane PS</b>	
Pumping Facility Number	144
Date of Initial Inspection	7/2/2008
Date of Update Inspection	6/8/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/7/2011
Date of Construction	1962
Address	600 Elmhurst Lane, Portsmouth
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	80 ft.
Firm Pumping Capacity (GPM)	6000 GPM
Total Pumping Capacity (GPM)	9000 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Allis Chalmers
Pump Nameplate Capacity	3000 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	U.S. Motor (2), General Electric (1)
Motor Nameplate Power (HP)	100, 100, 125
Generator Power (KW)	250

### Elmhurst Ln Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



**Table 144-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
144	Elmhurst Lane	Building	Building	2	1	Good	No Immediate Action Required	Dry well slab allows pooling of water on opposite side of floor drain. 2 ton crane. There was an insect nest in one of the roof vents.	1
144	Elmhurst Lane	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Louvers have some insect nests. They appear to be cleared regularly by HRSD personnel.	1
144	Elmhurst Lane	Wet well	Wet well	3	2	Good	Continue Scheduled Maintenance Activities	Some degradation of coating. 5/2012: HRSD PM inspection on 03/08/2012 indicates no major changes from the 2008 wet well data.	2
144	Elmhurst Lane	Influent Valve	Influent Valve	4	2	None to Report	Schedule Corrective Action	Leakage.	3
144	Elmhurst Lane	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Pump 1	Pump	2	1	Good	No Immediate Action Required	More leakage through stuffing box than drain can accommodate.	1
144	Elmhurst Lane	Pump 2	Pump	2	1	Good	No Immediate Action Required	Stuffing box drain not working. Missing name-plate. The check valve opens and then oscillates slightly (bouncing motion) when the pump operates.	1
144	Elmhurst Lane	Pump 3	Pump	2	1	Good	No Immediate Action Required	No Comment	1

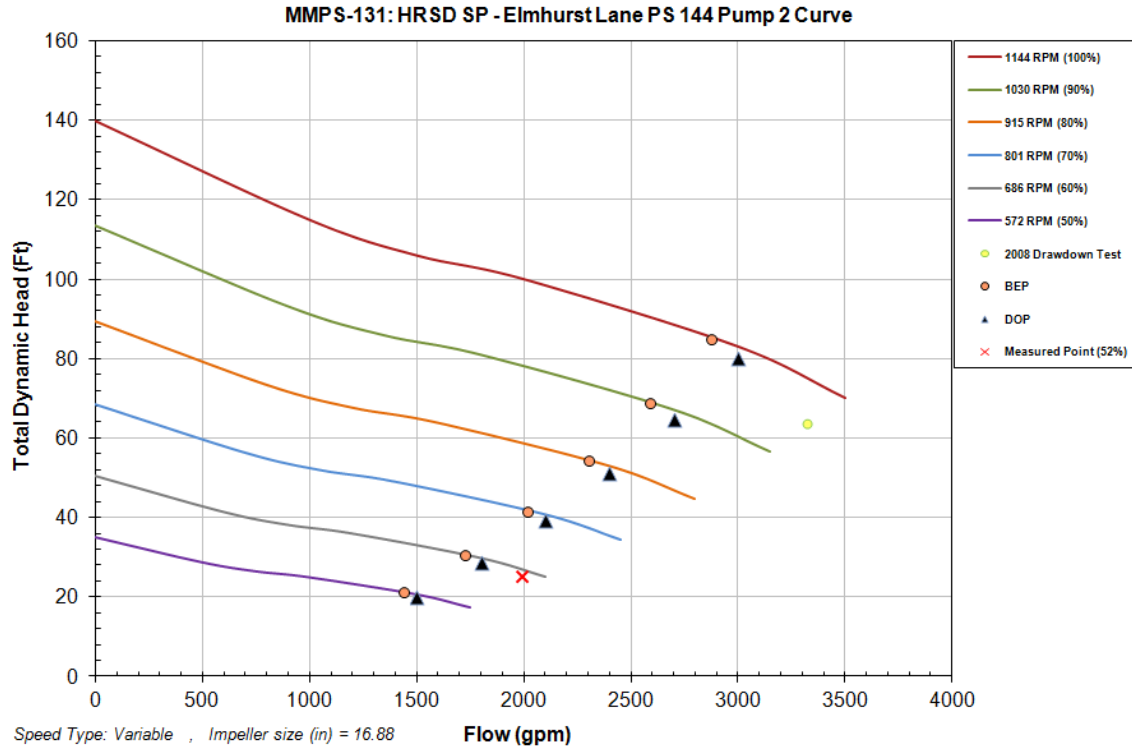
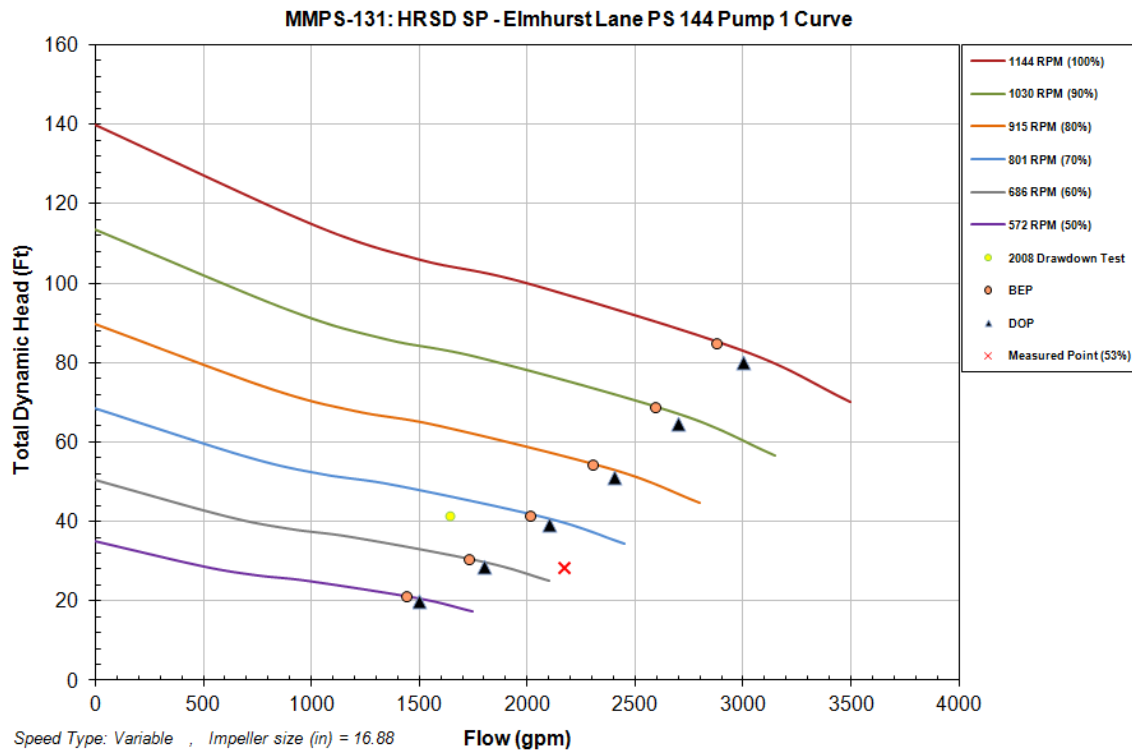
Table 144-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
144	Elmhurst Lane	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD inspections indicate no problems with isolation valve operation.	1
144	Elmhurst Lane	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
144	Elmhurst Lane	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

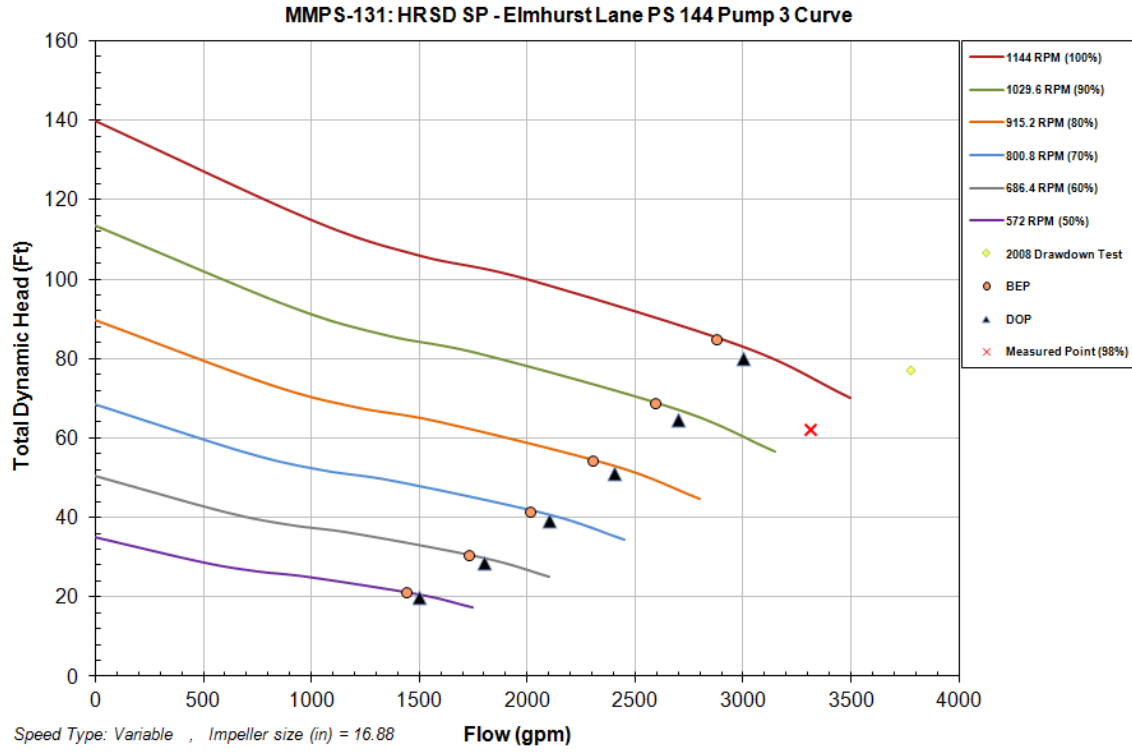


Table 144-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
144	Elmhurst Lane	Electrical Equipment	Electrical Equipment	2	1	Good Bare Wires	No Immediate Action Required	Lighting panel is full. MCC bus has corrosion.	1
144	Elmhurst Lane	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Exhaust has asbestos wrap. During inspection, the engine was having the water pump replaced.	1
144	Elmhurst Lane	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
144	Elmhurst Lane	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Elmhurst Ln Assets of Interest

None.

### Elmhurst Ln Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS & velocity profiler are not bonded to the station grounding system

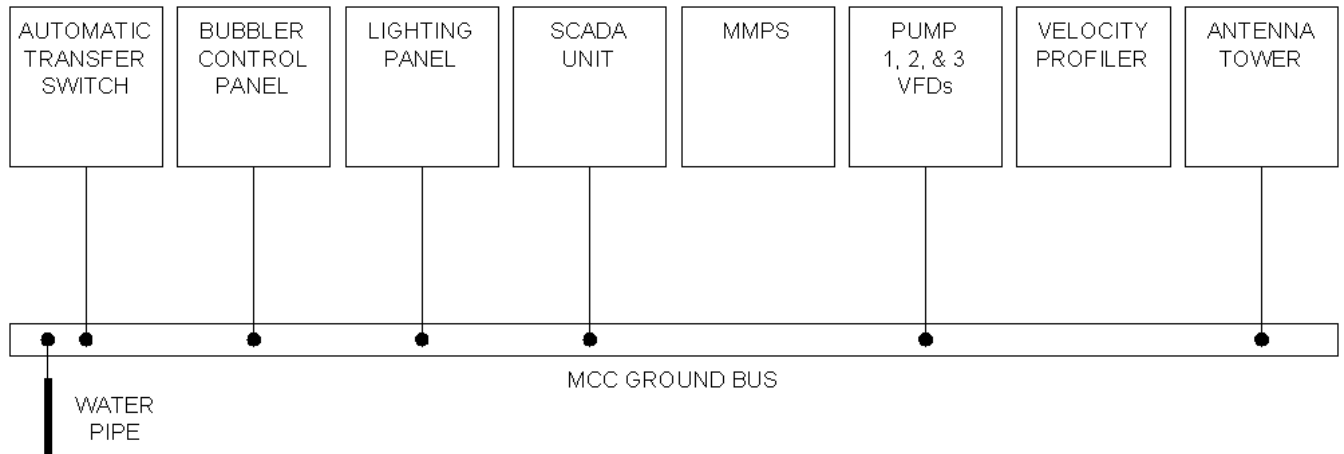


Figure 144-3. Elmhurst Ln Grounding System

### Elmhurst Ln Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions

- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 145 Rodman Ave Pump Station

### Rodman Ave Facility Description

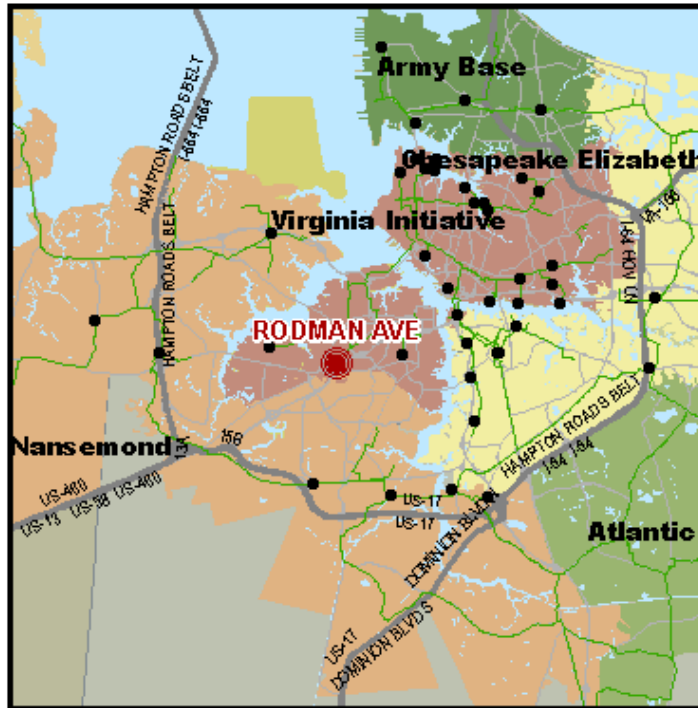


Figure 145-1. Rodman Ave PS Location Map



Figure 145-2. Rodman Ave PS

<b>Table 145-1. Rodman Ave PS</b>	
Pumping Facility Number	145
Date of Initial Inspection	7/2/2008
Date of Update Inspection	6/8/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/22/2011
Date of Construction	1942
Address	2412 Rodman Avenue, Portsmouth
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	42 ft.
Firm Pumping Capacity (GPM)	6600 GPM
Total Pumping Capacity (GPM)	9900 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Allis Chalmers
Pump Nameplate Capacity	3300 GPM
Standby Pump(s) present during inspection	12" Godwin CD300M
Motor Manufacturer	Marathon Electric
Motor Nameplate Power (HP)	50
Generator Power (KW)	100

### Rodman Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



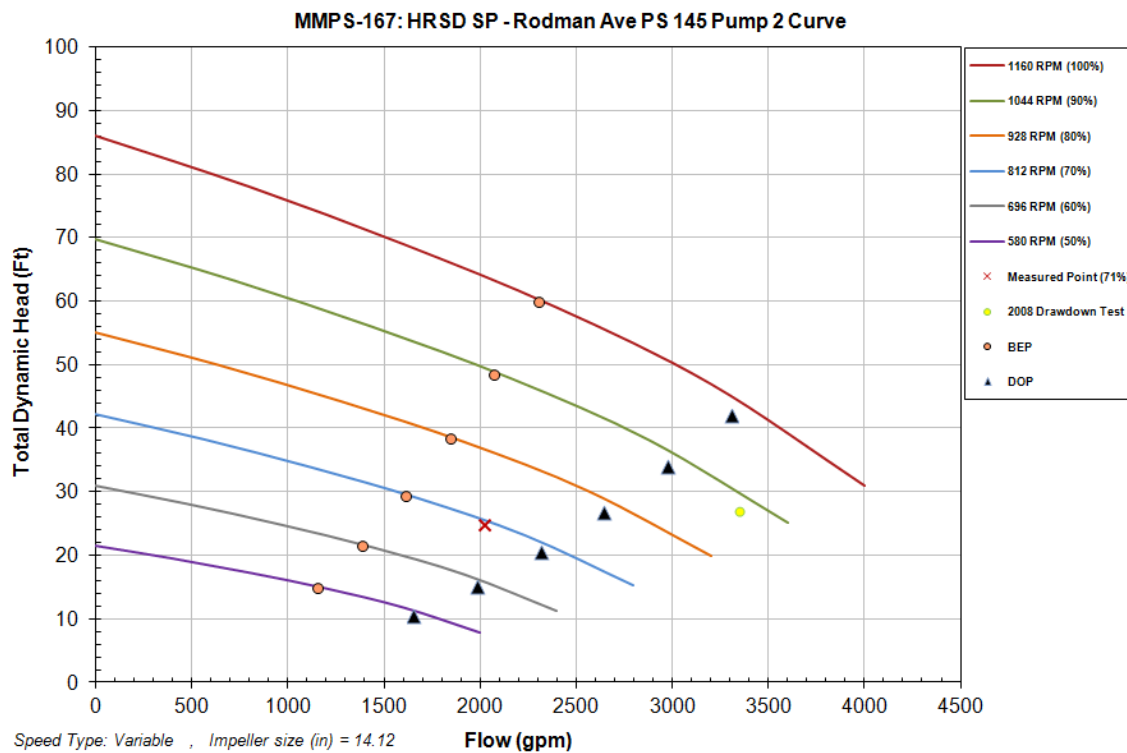
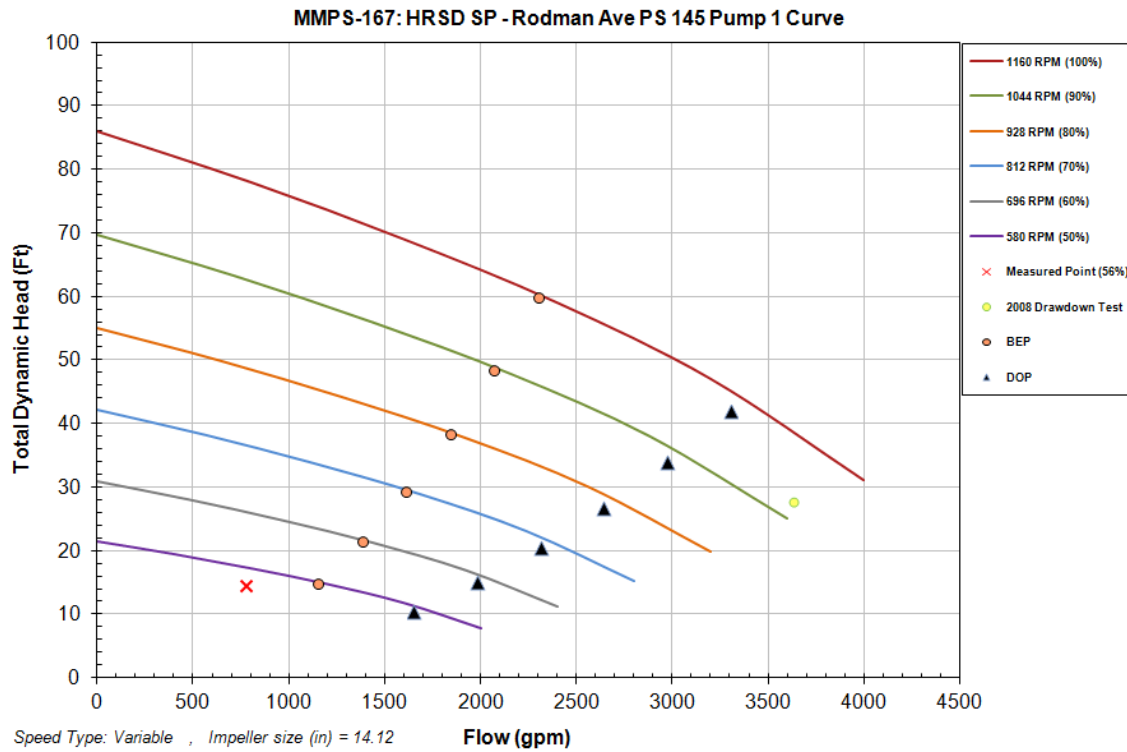
Table 145-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
145	Rodman Avenue	Building	Building	2	1	Good	No Immediate Action Required	Crane - 1 capacity sticker states 5000 lb and the other states 8000 lb.	1
145	Rodman Avenue	HVAC System	HVAC System	3	2	Duct Work Corroded	Continue Scheduled Maintenance Activities	Corrosion and pitting on wet well duct work. 1.5 HP Marathon Electric Blower Type TDR. Dry well intake bug screen dirty. Station has a Vapex Omega odor control unit - good condition.	2
145	Rodman Avenue	Wet well	Wet well	4	4	Concrete Spalling Concrete Corrosion	Replace/Refurbish	Aggregate loose in walls/floor. Reinforcing wire/bar exposed. 5/2012: HRSD PM inspection on 02/24/2012 indicates no major changes from the 2008 wet well data.	5
145	Rodman Avenue	Influent Valve	Influent Valve	4	2	None to Report	Schedule Corrective Action	Slide-plate possibly frozen.	3
145	Rodman Avenue	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Motor 3	Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Pump 1	Pump	2	1	Good	No Immediate Action Required	No Nameplate .Pump makes noise. The station has a temporary Godwin pump installed.	1
145	Rodman Avenue	Pump 2	Pump	2	1	Good	No Immediate Action Required	No nameplate. Pump #2	1
145	Rodman Avenue	Pump 3	Pump	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

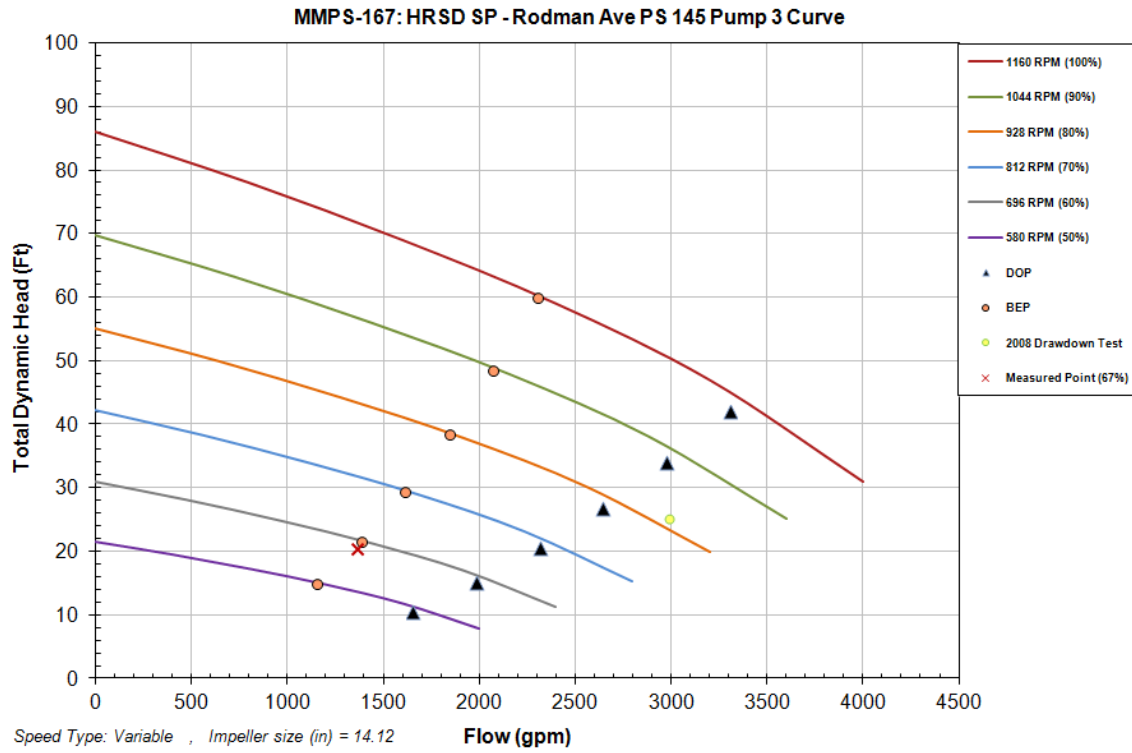
Table 145-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
145	Rodman Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	6/11: HRSD PM inspections indicate no problems with valve operation. #1 discharge valve drips	1
145	Rodman Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
145	Rodman Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
145	Rodman Avenue	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	Construction was in progress during visit.	1

Table 145-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
145	Rodman Avenue	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
145	Rodman Avenue	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
145	Rodman Avenue	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
145	Rodman Avenue	SCADA	SCADA	2	1	None to Report	No Immediate Action Required	No panel door grounding wire. Terminal strip not labeled. Panel wiring is messy.	1
145	Rodman Avenue	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Asbestos exhaust wrap.	1
145	Rodman Avenue	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
145	Rodman Avenue	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Rodman Ave Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Rodman Ave wet well is deteriorating. This wet well will be addressed under the Prompt Repair Program.



Figure 145-3. Rodman Ave Wet Well Walls



Figure 145-4. Rodman Ave Wet Well Deck

### Rodman Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler, vapor control panel, & bubbler control panel are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS, bubbler control panel, & velocity profiler are not bonded to the station grounding system

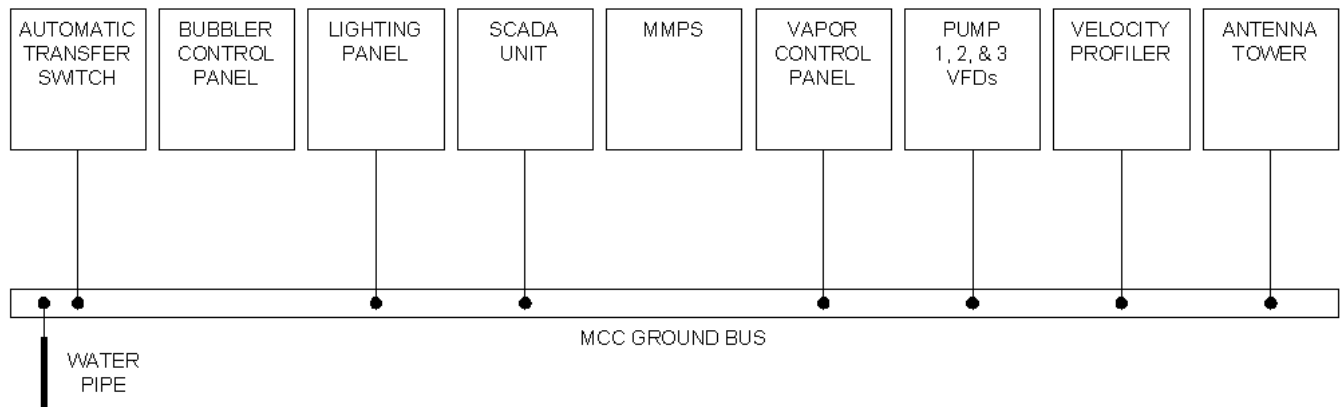


Figure 145-5. Rodman Ave Grounding System

### Rodman Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable



- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other



## PS 146 Camden Ave Pump Station

### Camden Ave Facility Description

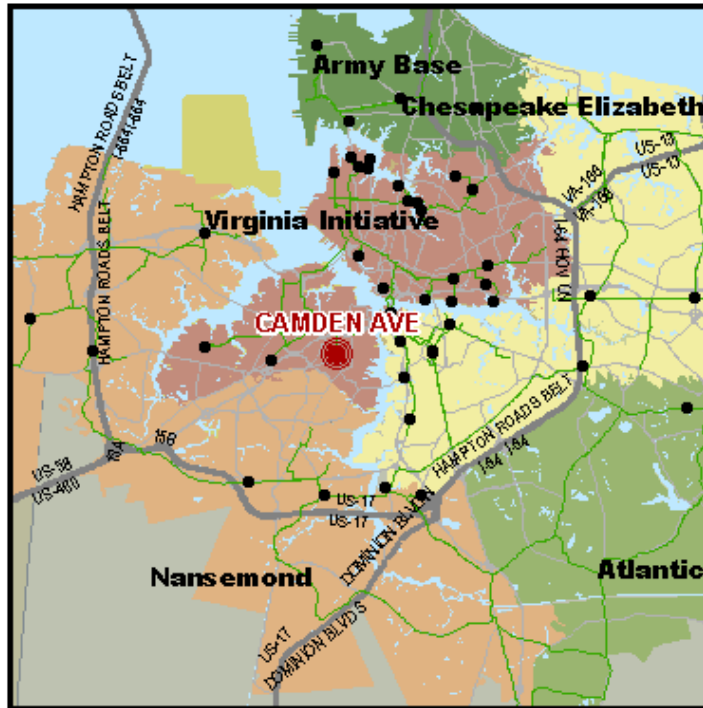


Figure 146-1. Camden Ave PS Location Map



Figure 146-2. Camden Ave PS

<b>Table 146-1. Camden Ave PS</b>	
Pumping Facility Number	146
Date of Initial Inspection	7/2/2008
Date of Update Inspection	6/8/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/22/2011
Date of Construction	1946
Address	2203 Camden Ave., Portsmouth
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	40 ft., 75 ft.
Firm Pumping Capacity (GPM)	8400 GPM
Total Pumping Capacity (GPM)	12600 GPM
Number of Pumps	3
Pump Type	Direct-coupled Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	4200 GPM
Standby Pump(s) present during inspection	12" Godwin CD300M
Motor Manufacturer	General Electric (2), Marathon Electric (1)
Motor Nameplate Power (HP)	125, 125, 75
Generator Power (KW)	265

### Camden Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

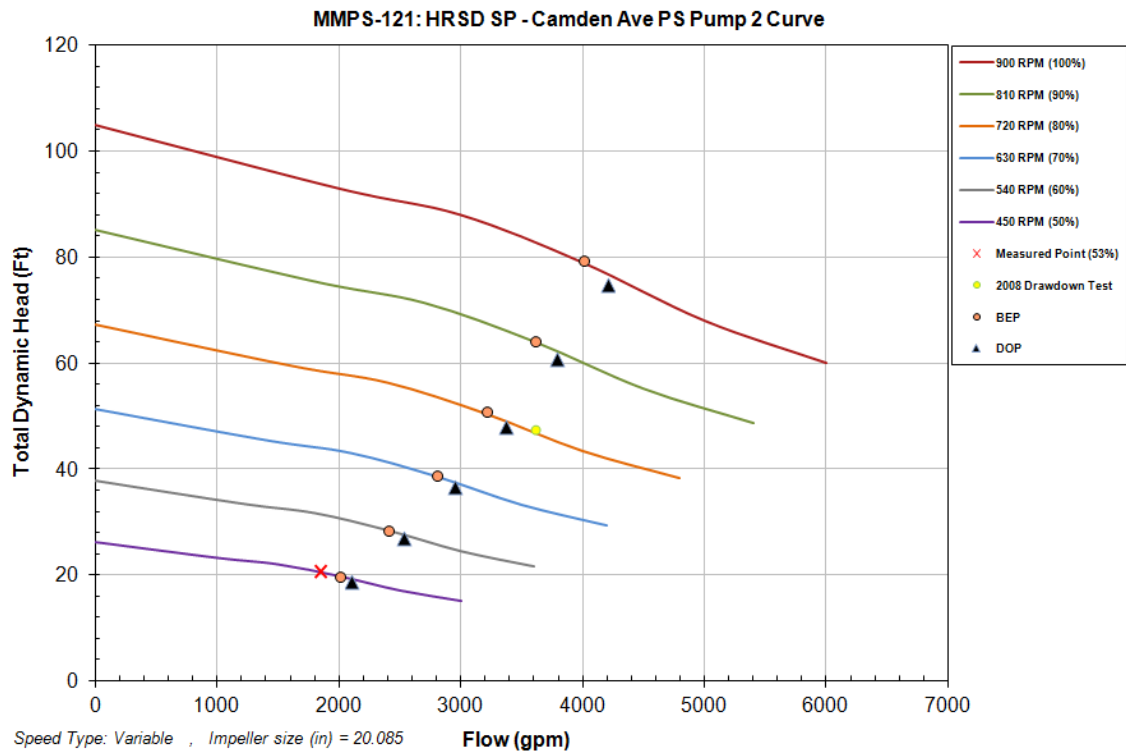
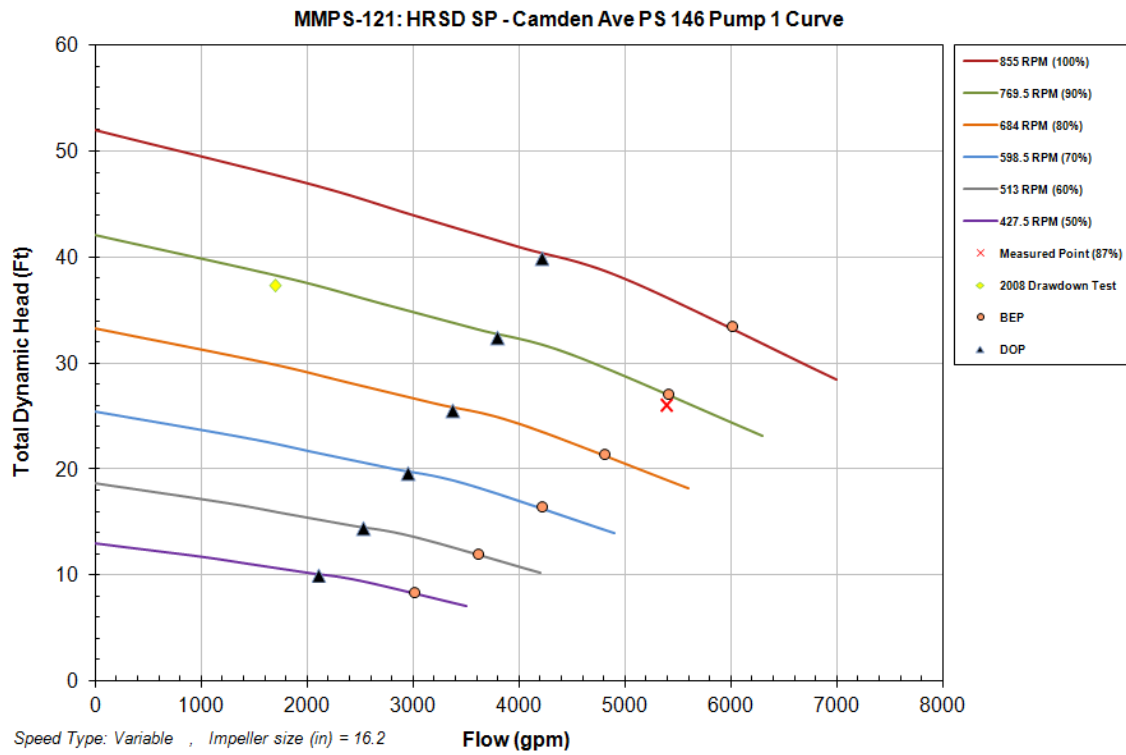
Table 146-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
146	Camden Avenue	Building	Building	2	1	Good	No Immediate Action Required	New gutters. Small mortar cracks in the generator room. Removal of dry well equipment will be difficult because of VFD retrofit. Crane in good condition. Godwin Pump onsite	1
146	Camden Avenue	HVAC System	HVAC System	3	2	Ventilation Inoperable	Continue Scheduled Maintenance Activities	Generator room louvers have holes in the insect screens. Louver at the front of the pump station has been fitted with Plexiglas to keep the vacuum lines from freezing. Duct work coupling disconnected from blower to dry well; out of service.	2
146	Camden Avenue	Wet well	Wet well	2	1	Good	No Immediate Action Required	5/2012: HRSD PM inspection on 03/20/2012 indicates no major changes from the 2008 wet well data.	1
146	Camden Avenue	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Motor 2	Wastewater Pump Motor and Controller	2	1	None to Report	No Immediate Action Required	No Comment	1
146	Camden Avenue	Motor 3	Wastewater Pump Motor and Controller	2	1	None to Report	No Immediate Action Required	No Comment	1
146	Camden Avenue	Motor	Air Compressor Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Motor	Air Compressor Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Motor	Vacuum Pump Motor and Controller	2	See Comments	None to Report	Continue Scheduled Maintenance Activities	Asset has been removed from service.	2

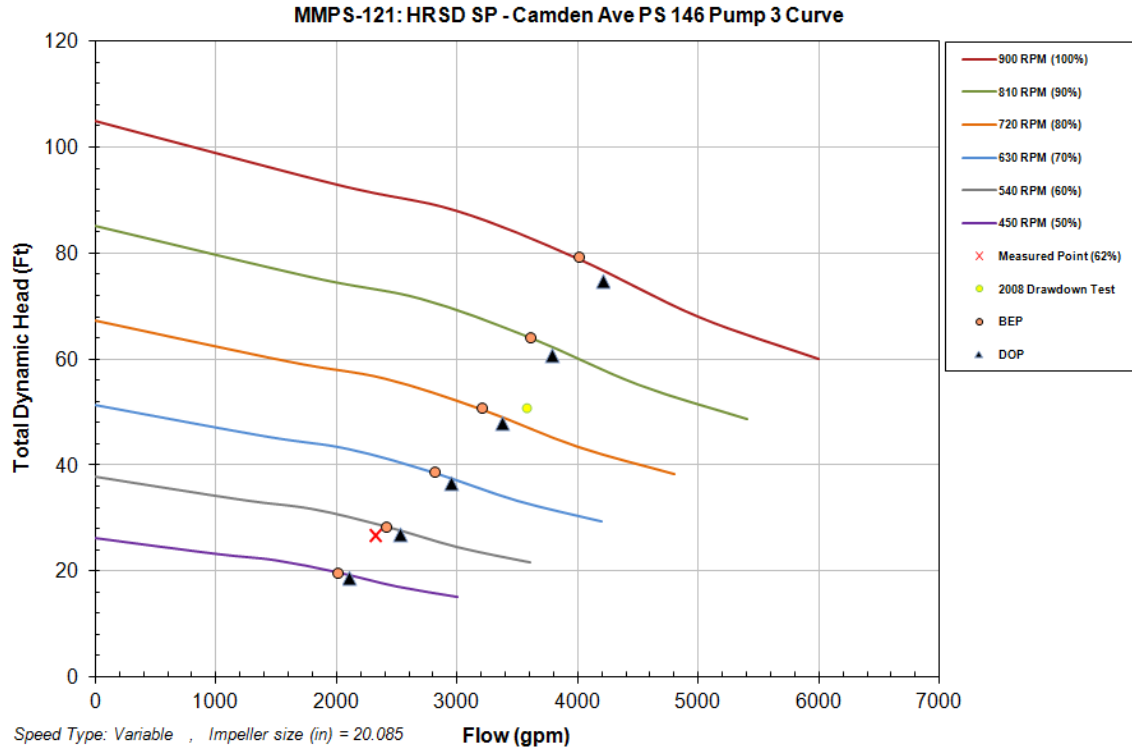
Table 146-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
146	Camden Avenue	Motor	Vacuum Pump Motor and Controller	2	1	None to Report	No Immediate Action Required	No Comment	1
146	Camden Avenue	Pump 1	Pump	2	1	Good	No Immediate Action Required	Direct drive horizontal. The bearings on all pumps use a seal water system that is tied to the discharge. It is in acceptable condition.	1
146	Camden Avenue	Pump 2	Pump	2	1	Good	No Immediate Action Required	Direct drive horizontal. The bearings on all pumps use a seal water system that is tied to the discharge. It is in acceptable condition.	1
146	Camden Avenue	Pump 3	Pump	3	2	Vibrating	Continue Scheduled Maintenance Activities	Could not verify nameplate. Direct drive horizontal. It appears that a guard is making contact with the shaft. The bearings on all pumps use a seal water system that is tied to the discharge. It is in acceptable condition.	2
146	Camden Avenue	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Pump	Vacuum Pump	2	See Comments	None to Report	Continue Scheduled Maintenance Activities	Asset has been removed from service.	2
146	Camden Avenue	Pump	Vacuum Pump	2	1	Good	No Immediate Action Required	The cooling water supply has heat trace tape installed.	1
146	Camden Avenue	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Motor controlled plug valves to prevent pump motor backspin are used in place of check valves. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
146	Camden Avenue	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 146-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
146	Camden Avenue	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
146	Camden Avenue	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Bubbler Panel	Bubbler Panel	1	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
146	Camden Avenue	VFD	VFD	1	1	No panel door ground wire	No Immediate Action Required	No Comment	1
146	Camden Avenue	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
146	Camden Avenue	MMPS	MMPS	1	1	Uncapped wires loose in the panel	No Immediate Action Required	No Comment	1
146	Camden Avenue	SCADA	SCADA	2	1	No panel door grounding wire. Terminal strip not labeled.	No Immediate Action Required	No Comment	1

Table 146-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
146	Camden Avenue	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
146	Camden Avenue	Transfer Switch	Transfer Switch	3	2	Good	Continue Scheduled Maintenance Activities	Panel is corroded	2
146	Camden Avenue	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Exhaust has asbestos wrap.	1
146	Camden Avenue	Generator	Generator	3	1	None to Report	Continue Scheduled Maintenance Activities	Generator instrument/control panel beginning to rust.	2
146	Camden Avenue	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
146	Camden Avenue	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing







### Camden Ave Assets of Interest

None.

### Camden Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system

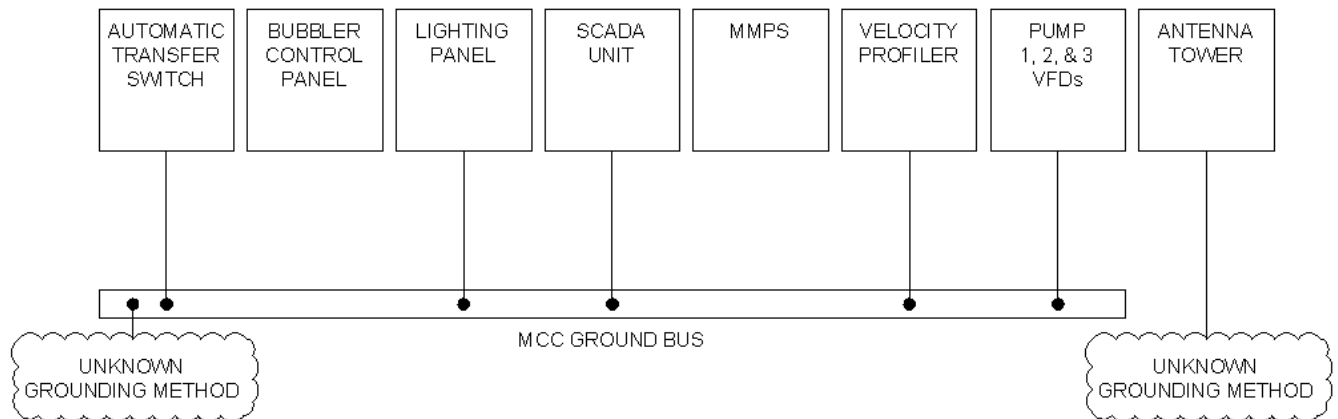


Figure 146-3. Camden Ave Grounding System

### Camden Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment

- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other



<b>Table 147-1. Chesterfield Blvd PS</b>	
Pumping Facility Number	147
Date of Initial Inspection	6/19/2008
Date of Update Inspection	6/20/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	6/22/2011
Date of Construction	1976
Address	2731 Chesterfield Blvd, Norfolk
Receiving Facility	Virginia Initiative Treatment Plant
Design Head (Feet)	30 ft.
Firm Pumping Capacity (GPM)	600 GPM
Total Pumping Capacity (GPM)	1200 GPM
Number of Pumps	2
Pump Type	Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	600 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M - Removed
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	8
Generator Power (KW)	None

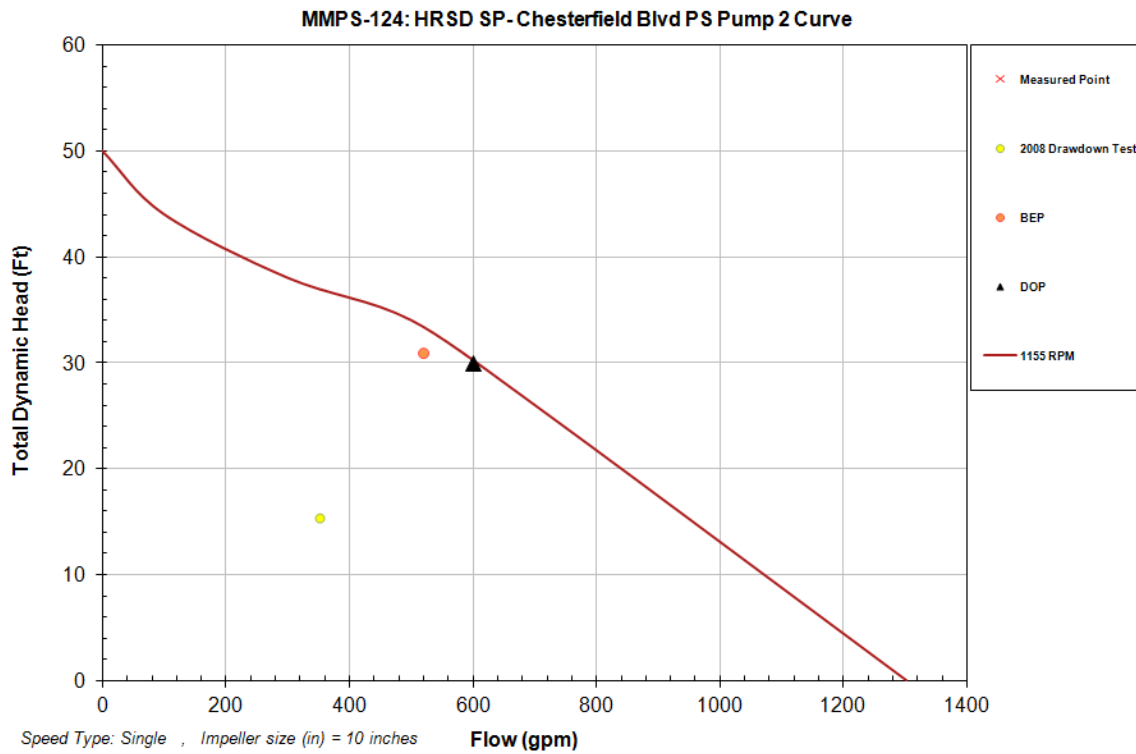
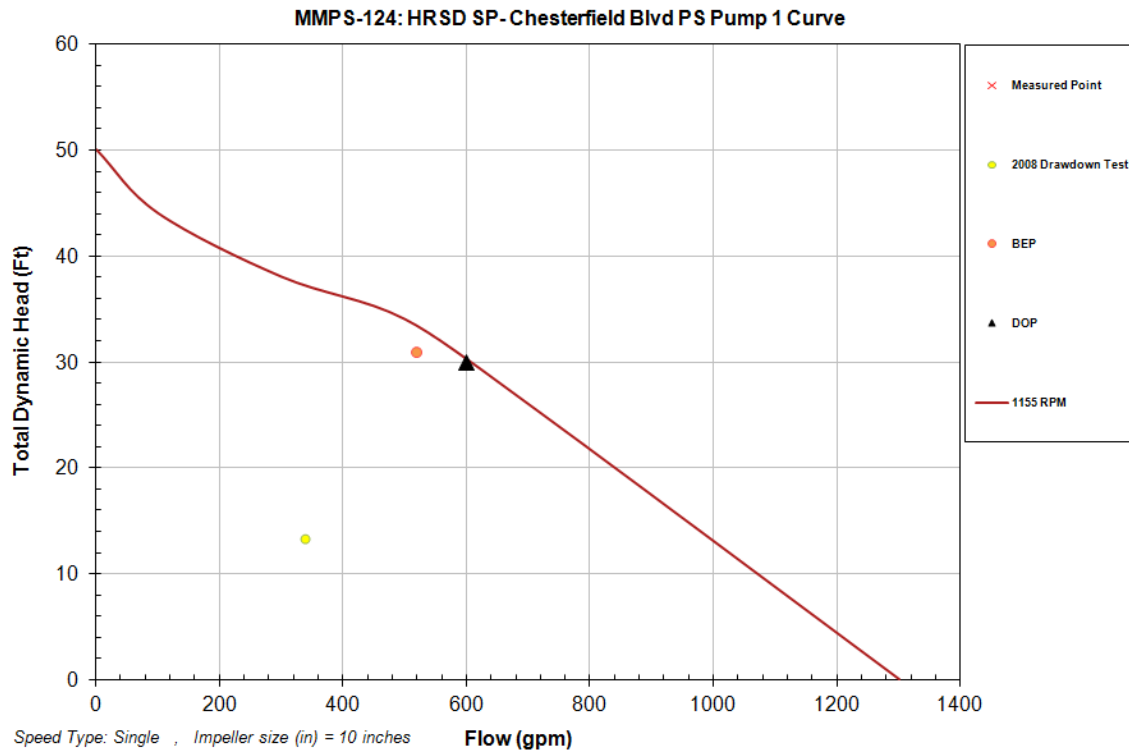
### **Chesterfield Blvd Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 147-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
147	Chesterfield Blvd	Wet well	Wet well	4	3	None to Report	Schedule Corrective Action	Hatches may not be traffic rated but bollards are in place. Ops reports heavy grease loading at the station. 5/2012: HRSD PM inspection on 03/06/2012 indicates significant deterioration at the wet well discharge piping penetrations.	3
147	Chesterfield Blvd	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
147	Chesterfield Blvd	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
147	Chesterfield Blvd	Pump 1	Pump	2	1	Good	No Immediate Action Required	No Comment	1
147	Chesterfield Blvd	Pump 2	Pump	2	1	Good	No Immediate Action Required	There appears to be leakage around the discharge below the water level. The may be leakage past the check valve.	1
147	Chesterfield Blvd	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	#2 check valve may be leaking but could not confirm. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
147	Chesterfield Blvd	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
147	Chesterfield Blvd	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
147	Chesterfield Blvd	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
147	Chesterfield Blvd	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 147-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
147	Chesterfield Blvd	Electrical Equipment	Electrical Equipment	3	2	Good Panel Corroded Dust Inside Panel	Continue Scheduled Maintenance Activities	No backup power source or power feed hookup.	2
147	Chesterfield Blvd	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
147	Chesterfield Blvd	Bubbler Panel	Bubbler Panel	3	2	Panel is Corroded. No panel door grounding wire is installed.	Continue Scheduled Maintenance Activities	No Comment	2
147	Chesterfield Blvd	Compressor	Compressor	2	2	None to Report	No Immediate Action Required	No Comment	1
147	Chesterfield Blvd	MMPS	MMPS	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
147	Chesterfield Blvd	SCADA	SCADA	2	1	No panel door grounding wire. Panel corrosion was observed.	No Immediate Action Required	No Comment	1

### Draw-Down Testing



There is no measured point reported because the flow meter was removed from Chesterfield Blvd PS.



### Chesterfield Blvd Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Chesterfield Blvd wet well is deteriorating. Chesterfield Blvd PS is being abandoned as part of the Interim System Improvements.



Figure 147-3. Chesterfield Blvd Wet Well

### Chesterfield Blvd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity Profiler is not protected by a surge suppressor
- Equipment properly Grounded:
  - Velocity Profiler & MMPS are not bonded to the station grounding system



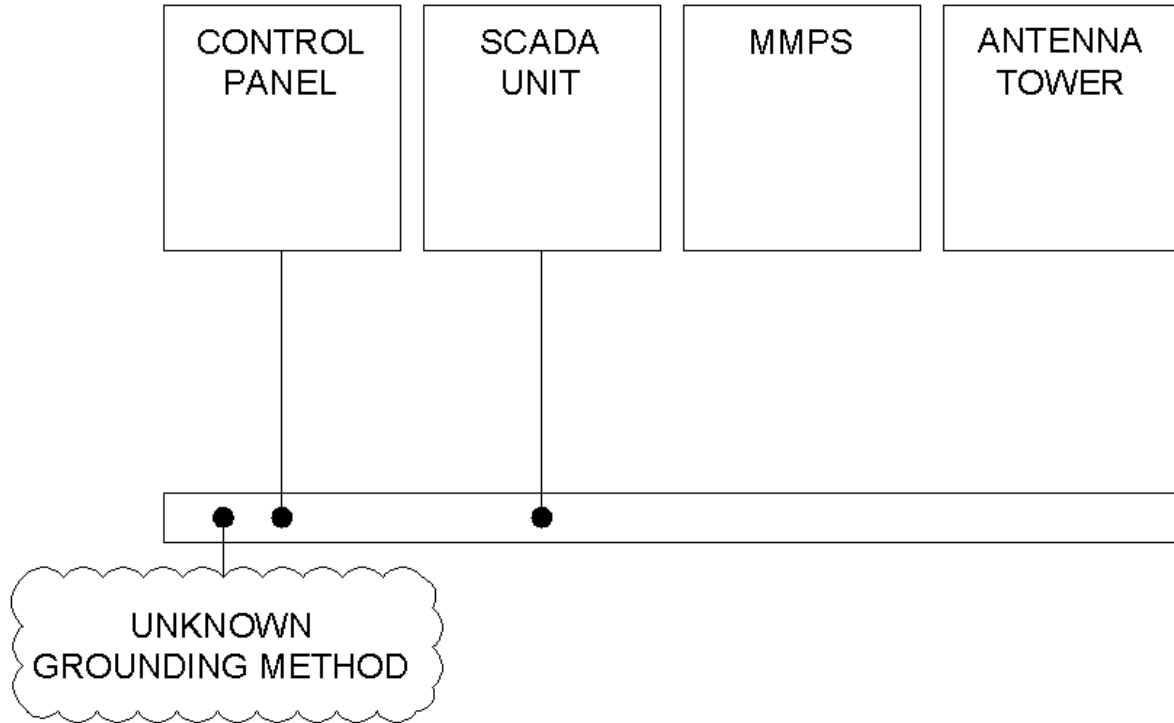


Figure 147-4. Chesterfield Blvd Grounding System

### Chesterfield Blvd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact

- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - No backup power source or power feed hookup

# PS 148 Ingleside Rd Pump Station

## Ingleside Rd Facility Description

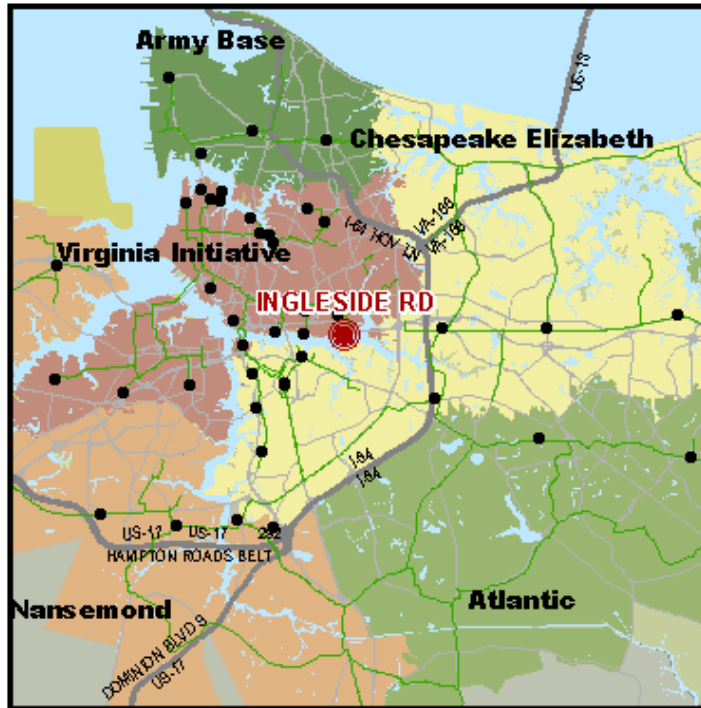


Figure 148-1. Ingleside Rd PS Location Map



Figure 148-2. Ingleside Rd PS

**Table 148-1. Ingleside Rd PS**

<b>Pumping Facility Number</b>	<b>148</b>
<b>Date of Initial Inspection</b>	<b>6/25/2008</b>
<b>Date of Update Inspection</b>	<b>6/20/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>6/21/2011</b>
<b>Date of Construction</b>	<b>1976</b>
<b>Address</b>	<b>600 Ingleside Road, Norfolk</b>
<b>Receiving Facility</b>	<b>Virginia Initiative Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>30 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>600 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>1200 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Submersible</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>600 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Motor Nameplate Power (HP)</b>	<b>8</b>
<b>Generator Power (KW)</b>	<b>None</b>

### **Ingleside Rd Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

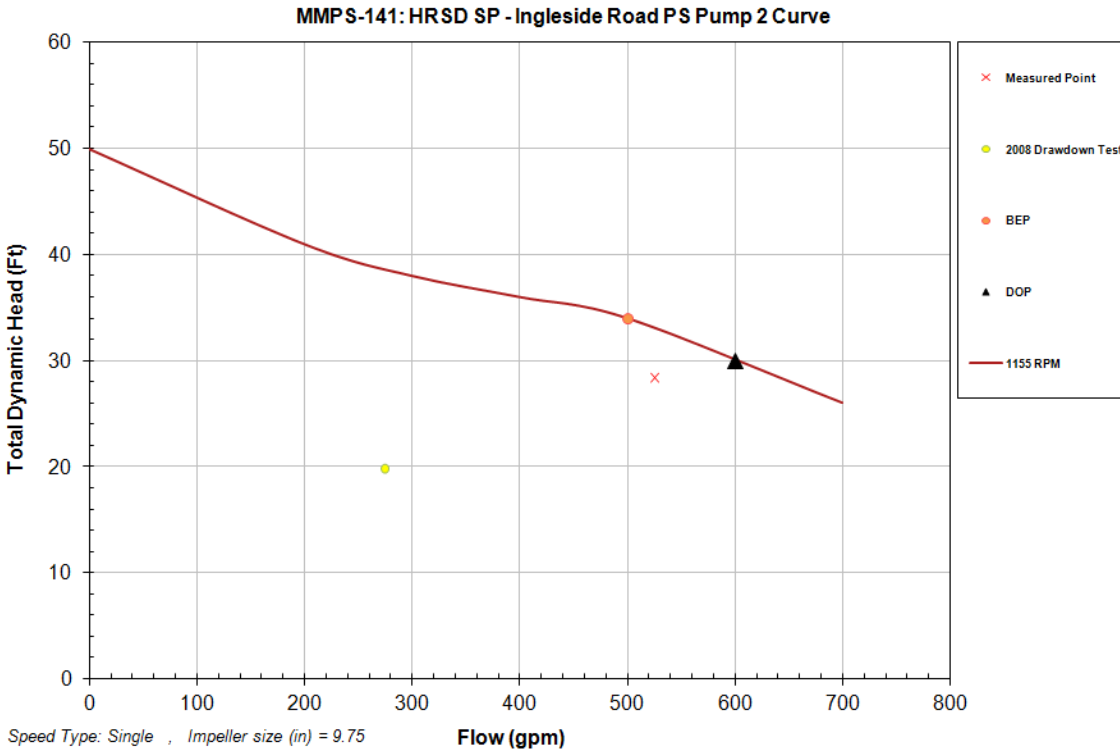
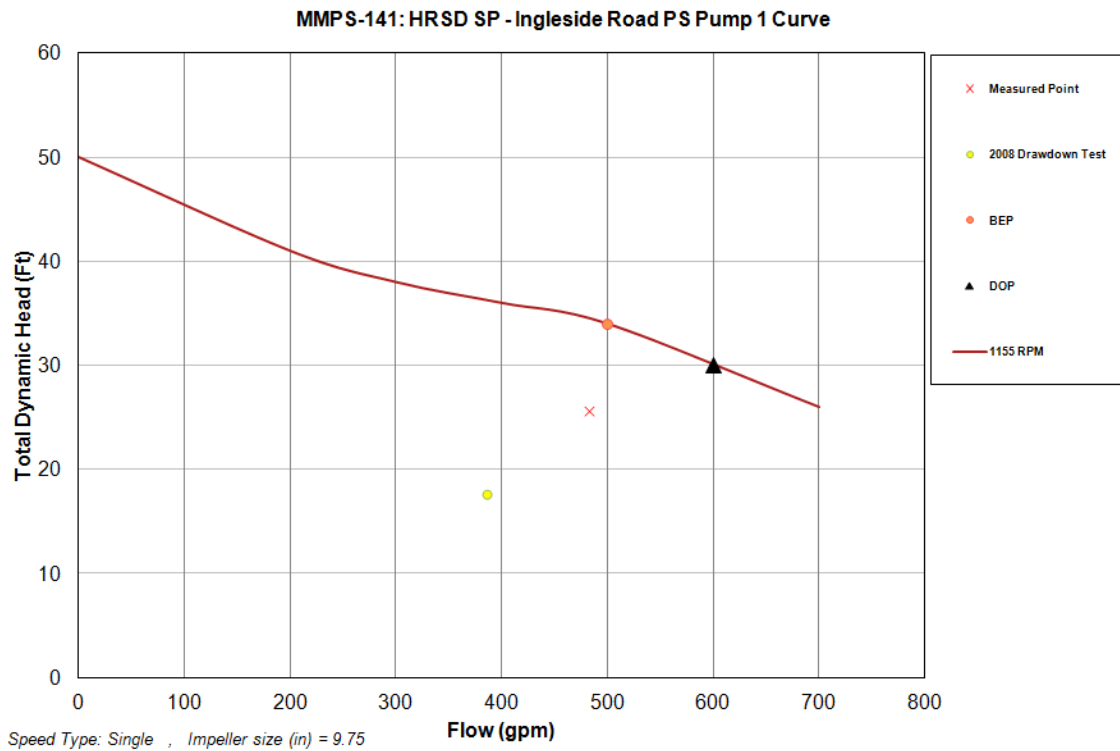
**Table 148- 2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
148	Ingleside Road	Wet well	Wet well	5	4	None to report	Replace/Refurbish	Hatches damaged from vehicular traffic and corrosion. Likely too light/thin for traffic rating. There is exposed aggregate in the wet well. 5/2012: HRSD PM inspection on 03/06/2012 indicates no major changes from the 2008 wet well data.	5
148	Ingleside Road	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Could not verify, submerged.	1
148	Ingleside Road	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Could not verify, submersed.	1
148	Ingleside Road	Pump 1	Pump	2	1	Good	No Immediate Action Required	Fluid swirls in wet well during pump operation.	1
148	Ingleside Road	Pump 2	Pump	2	2	Good	No Immediate Action Required	Possible discharge leaking indicated by bubbles during pump operation. Fluid swirls in wet well during pump operation.	1
148	Ingleside Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
148	Ingleside Road	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
148	Ingleside Road	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
148	Ingleside Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
148	Ingleside Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
148	Ingleside Road	Electrical Equipment	Electrical Equipment	2	2	Good Panel Corroded Panel Obsolete	No Immediate Action Required	No automatic back up power source.	1
148	Ingleside Road	Instrumentation System	Instrumentation System	2	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
148	Ingleside Road	Bubbler Panel	Bubbler Panel	3	2	None to Report	Continue Scheduled Maintenance Activities	No Comment	2

**Table148- 2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
148	Ingleside Road	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
148	Ingleside Road	MMPS	MMPS	1	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
148	Ingleside Road	SCADA	SCADA	2	1	No panel door grounding wire. Panel corrosion was observed.	No Immediate Action Required	No Comment	1

## Draw-Down Testing



### Ingleside Rd Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Ingleside Rd wet well is deteriorating and the hatch should be replaced. The hatch is scheduled for replacement under the Prompt Repairs Program.



Figure 148-3. Ingleside Rd Wet Well.

### Ingleside Rd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system



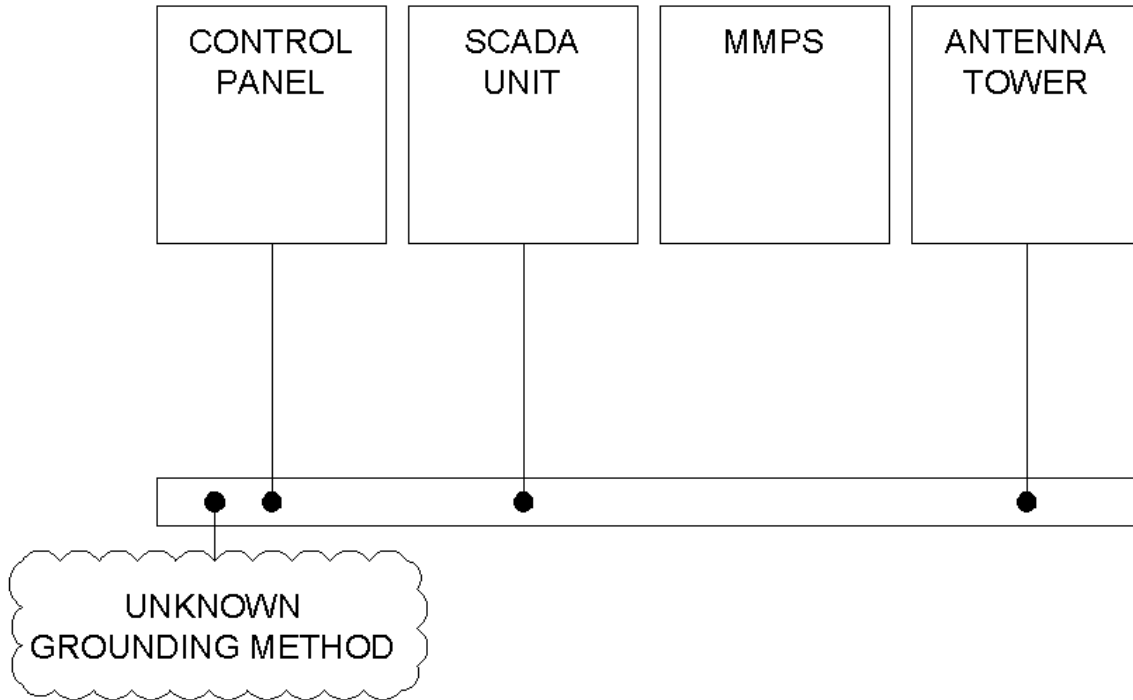


Figure 148-4. Ingleside Rd Grounding System

### Ingleside Rd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact

- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - No automatic back up power source

## PRS 151 Kempsville Rd Pressure Reducing Station

### Kempsville Rd Facility Description



Figure 151-1. Kempsville Rd PRS Location Map



Figure 151-2. Kempsville Rd PRS

<b>Table 151-1. Kempsville Rd PRS</b>	
Pumping Facility Number	151
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/24/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/21/2011
Date of Construction	1995
Address	4765 Ferrell Parkway, Virginia Beach
Receiving Facility	Atlantic Treatment Plant
Design Head (Feet)	57 ft.
Firm Pumping Capacity (GPM)	20000 GPM
Total Pumping Capacity (GPM)	30000 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	10000 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Teco Induction Motor
Motor Nameplate Power (HP)	200
Generator Power (KW)	600

### **Kempsville Rd Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

**Table 151-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
151	Kempsville Road	Building	Building	2	1	None to Report	No Immediate Action Required	Front porch, slight pulling away from façade.	1
151	Kempsville Road	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	There is an intake on the back of the building which is 50% clogged with dirt - must use small access panel in dry well to clean.	1
151	Kempsville Road	Motor 1	Wastewater Pump Motor and Controller	2	2	Vibrates	No Immediate Action Required	Vibration could be attributed to motor mounting. Vibration resonates through the entire motor room floor. There was no indication that the apparent vibration will cause equipment damage.	1
151	Kempsville Road	Motor 2	Wastewater Pump Motor and Controller	2	2	Vibrates	No Immediate Action Required	Vibration could be attributed to motor mounting. Vibration resonates through the entire motor room floor. There was no indication that the apparent vibration will cause equipment damage.	1
151	Kempsville Road	Motor 3	Wastewater Pump Motor and Controller	2	2	Vibrates	No Immediate Action Required	Vibration could be attributed to motor mounting. Vibration resonates through the entire motor room floor. There was no indication that the apparent vibration will cause equipment damage.	1
151	Kempsville Road	Pump 1	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	Vibration did not seem severe - may be attributed to motor mount design. There was no indication that the apparent vibration will cause equipment damage.	1
151	Kempsville Road	Pump 2	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	Vibration did not seem severe - may be attributed to motor mount design. There was no indication that the apparent vibration will cause equipment damage.	1

**Table 151-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
151	Kempsville Road	Pump 3	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	Vibration did not seem severe - may be attributed to motor mount design. Pump #3 vibrated less - may be due to physical location in more rigid portion of building. There was no indication that the apparent vibration will cause equipment damage.	1
151	Kempsville Road	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
151	Kempsville Road	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
151	Kempsville Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valve #1 and #3 had an audible slam on closure. 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
151	Kempsville Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Check Valve Pump 1	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Check Valve Pump 3	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
151	Kempsville Road	Electrical Equipment	Electrical Equipment	2	1	Good Dust Inside Panel	No Immediate Action Required	Corrosion on VFD Bus	1

**Table 151-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
151	Kempsville Road	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
151	Kempsville Road	Control Panel	Control Panel	2	1	Sloppy panel wiring. Some corrosion on the ground bus. No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
151	Kempsville Road	VFD	VFD	2	1	None to Report	No Immediate Action Required	Lugs & buses showing signs of corrosion	1
151	Kempsville Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
151	Kempsville Road	SCADA	SCADA	2	1	None to Report	No Immediate Action Required	No panel door grounding wire. Uncapped wires loose in panel.	1
151	Kempsville Road	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
151	Kempsville Road	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Unable to shutdown and open. Equipment appears fairly new.	1
151	Kempsville Road	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
151	Kempsville Road	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
151	Kempsville Road	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
151	Kempsville Road	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
151	Kempsville Road	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing

Not Applicable

### Kempsville Rd Assets of Interest

None.

### Kempsville Rd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler & control panel are not protected by a surge suppressor
- Equipment properly Grounded:
  - Velocity profiler & MMPS are not bonded to the station grounding system
  - Remote radiator structure is not grounded

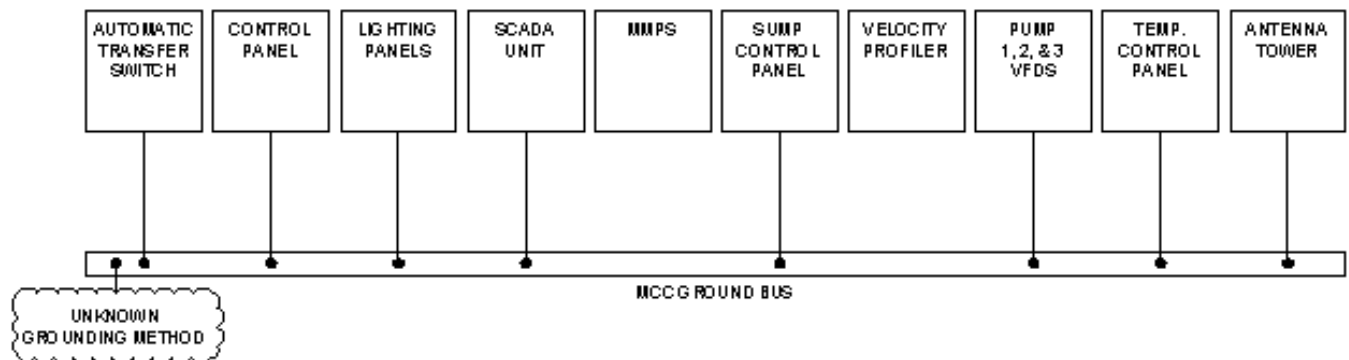


Figure 151-3. Kempsville Rd Grounding System

### Kempsville Rd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged



- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PRS 152 Terminal Blvd Pressure Reducing Station

### Terminal Blvd Facility Description



Figure 152-1. Terminal Blvd PS Location Map



Figure 152-2. Terminal Blvd PRS

<b>Table 152-1. Terminal Blvd PRS</b>	
Pumping Facility Number	152
Date of Initial Inspection	6/23/2008
Date of Update Inspection	6/22/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/19/2011
Date of Construction	1992
Address	7808 Newport Avenue, Norfolk
Receiving Facility	Army Base Treatment Plant
Design Head (Feet)	60 ft.
Firm Pumping Capacity (GPM)	13200 GPM
Total Pumping Capacity (GPM)	19800 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	6600 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	U.S. Electric
Motor Nameplate Power (HP)	125
Generator Power (KW)	450

### Terminal Blvd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 152-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
152	Terminal Blvd	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
152	Terminal Blvd	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Small louver in generator room has more degradation than others. The dry well ventilation intake is approximately 10% blocked with dirt.	1
152	Terminal Blvd	Motor 1	Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Motor mounting most likely leads to vibration - mostly when motor changes speed.	1
152	Terminal Blvd	Motor 2	Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Motor mounting most likely leads to vibration - mostly when motor changes speed.	1
152	Terminal Blvd	Motor 3	Motor and Controller	2	1	Good Vibrates	No Immediate Action Required	Motor mounting most likely leads to vibration - mostly when motor changes speed.	1
152	Terminal Blvd	Pump 1	Pump	3	1	Cavitating	Continue Scheduled Maintenance Activities	Eccentric reducers upside down. Air and cavitation problems. Packing spraying more than expected. On date of assessment cavitation was observed to be intermittent and most likely associated with inadequate influent side pressure.	2
152	Terminal Blvd	Pump 2	Pump	3	1	Cavitating	Continue Scheduled Maintenance Activities	Eccentric reducers upside down. On date of assessment cavitation was observed to be intermittent and most likely associated with inadequate influent side pressure. Discharge pressure gauge not working.	2
152	Terminal Blvd	Pump 3	Pump	3	2	Vibrating Cavitating	Continue Scheduled Maintenance Activities	Eccentric reducers upside down. Intermittent cavitation as with other pumps likely because of inadequate influent side pressure. Vibration not present at full speed.	2
152	Terminal Blvd	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Pump 5	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

**Table 152-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
152	Terminal Blvd	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Site has ragging issues at times. Check valve #1 ragged on day of visit and a crew was dispatched to clear it. Discharge valve #2 leaking. Bypass gate valves and 1 check valve - 24". Bypass piping has 4 psi drop. 6/11: HRSD inspections: Performs as intended.	1
152	Terminal Blvd	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
152	Terminal Blvd	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
152	Terminal Blvd	Electrical Equipment	Electrical Equipment	2	1	Good Cables Fatigued and Cracked	No Immediate Action Required	New VFDs are in the process of being installed. No door grounding wire on the VFDs & the flow transmitter panel.	1
152	Terminal Blvd	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Control Panel	Control Panel	2	1	No panel door grounding wire is installed. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1

Table 152-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
152	Terminal Blvd	VFD	VFD	2	1	None to Report	No Immediate Action Required	Some corrosion on ground bus	1
152	Terminal Blvd	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
152	Terminal Blvd	SCADA	SCADA	2	1	No panel door grounding wire is installed. Uncapped wires loose in the panel. Terminal strip not labeled.	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Transfer Switch	Transfer Switch	2	1	Good Cables Fatigued and Checked No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
152	Terminal Blvd	Tank 2	Fuel Tank	3	1	Good	Continue Scheduled Maintenance Activities	UST - Not inspected beyond what is visible at ground level.	2

### Drawdown Testing

Not applicable.

### Terminal Blvd Assets of Interest

None.

### Terminal Blvd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Flow transmitter panel & control panel are not protected by a surge suppressor
- Equipment properly Grounded:
  - Flow transmitter panel & MMPS are not bonded to the station grounding system
  - Remote radiator structure is not grounded

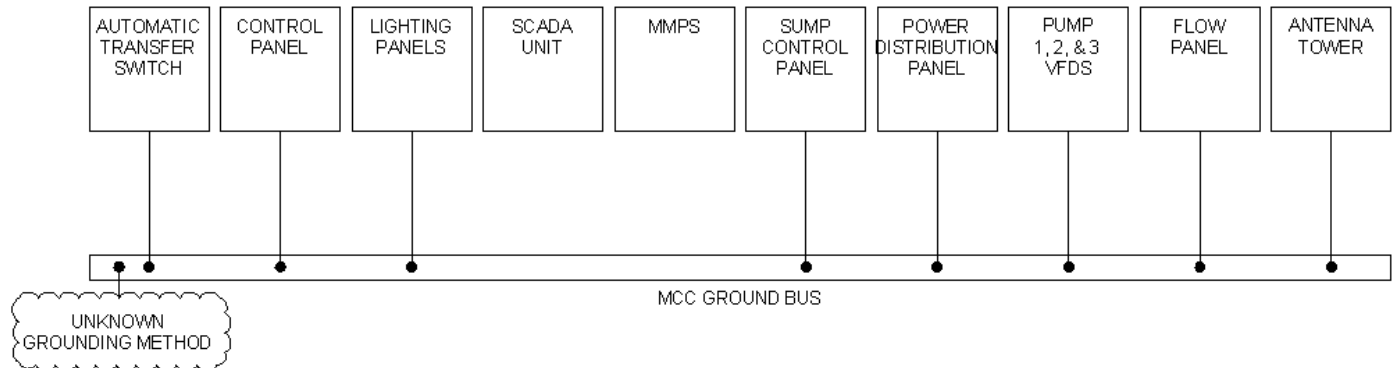


Figure 152-3. Terminal Blvd Grounding System

### Terminal Blvd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged



- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PRS 153 Laskin Rd Pressure Reducing Station

### Laskin Rd Facility Description

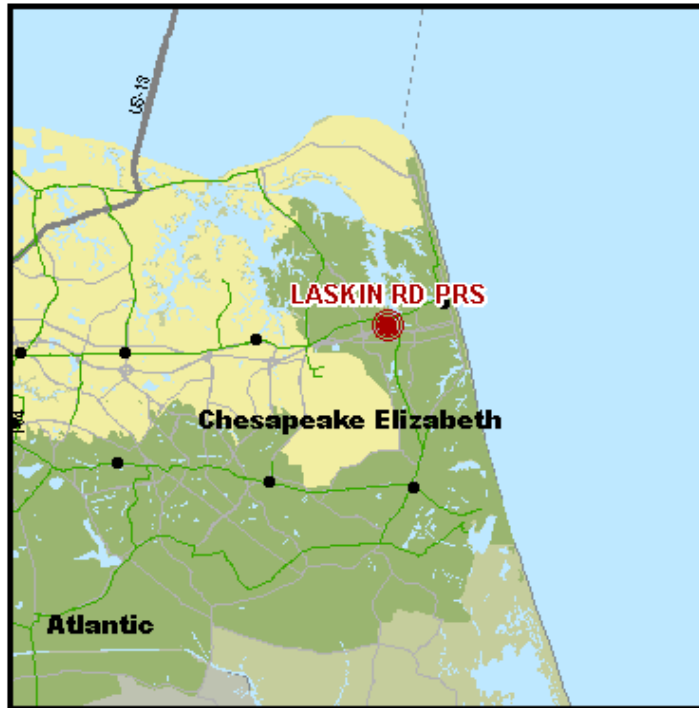


Figure 153-1. Laskin Rd PRS Location Map



Figure 153-2. Laskin Rd PRS

<b>Table 153-1. Laskin Rd PRS</b>	
Pumping Facility Number	153
Date of Initial Inspection	6/19/2008
Date of Update Inspection	6/24/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/21/2011
Date of Construction	1993
Address	590 Fremac Avenue, Virginia Beach
Receiving Facility	Atlantic Treatment Plant
Design Head (Feet)	68.4 ft.
Firm Pumping Capacity (GPM)	16666 GPM
Total Pumping Capacity (GPM)	25000 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	8333 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Teco Induction Motor
Motor Nameplate Power (HP)	200
Generator Power (KW)	600

### Laskin Rd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 153-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
153	Laskin Road	Building	Building	1	1	Good	No Immediate Action Required	5 ton crane.	1
153	Laskin Road	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Motor 1	Wastewater Pump Motor and Controller	1	See Comments	Good	Continue Scheduled Maintenance Activities	Verify motors are inverter rated. Motor not run during 2011 inspection due to dry weather conditions and potential for cavitation due to low influent pressure. Motor rotation direction arrow placard facing the wrong direction.	2
153	Laskin Road	Motor 2	Wastewater Pump Motor and Controller	1	See Comments	Good	Continue Scheduled Maintenance Activities	Verify motors are inverter rated. Motor run for a brief period – unable to give performance score. Check valve ragged when pump was shut down and a crew was called to derag the valve. Motor rotation direction arrow placard facing the wrong direction.	2
153	Laskin Road	Motor 3	Wastewater Pump Motor and Controller	1	See Comments	Good	Continue Scheduled Maintenance Activities	Verify motors are inverter rated. Motor not run during 2011 inspection due to dry weather conditions and potential for cavitation due to low influent pressure.	2
153	Laskin Road	Pump 1	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Pump not run in 2011 during inspection due to dry weather conditions and potential for cavitation due to low influent pressure. Suction pressure 21.6 psi Discharge pressure 20.1 psi	2
153	Laskin Road	Pump 2	Pump	3	See Comments	Cavitating	Continue Scheduled Maintenance Activities	Pump run for a brief period – unable to give performance score. Check valve ragged when pump was shut down and a crew was called to derag the valve. Cavitation observed during 2008 inspections and was attributed low suction pressure.	2
153	Laskin Road	Pump 3	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Pump not run in 2011 during inspection due to dry weather conditions and potential for cavitation due to low influent pressure.	2

**Table 153-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
153	Laskin Road	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Bypass check valve shaft leaking. Check valve performance not verified. Check valve #2 ragged after a brief pump run. A crew was immediately dispatched to obstruction. 6/11: HRSD PM annual inspection on 3/8/11 indicates discharge isolation valve #2 is tight in operation.	1
153	Laskin Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
153	Laskin Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
153	Laskin Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
153	Laskin Road	Check Valve Pump 1	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
153	Laskin Road	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
153	Laskin Road	Check Valve Pump 3	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
153	Laskin Road	Bypass Check Valve	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments.	2
153	Laskin Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
153	Laskin Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
153	Laskin Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
153	Laskin Road	Electrical Equipment	Electrical Equipment	2	1	Good Dust Inside Panel	No Immediate Action Required	Corrosion on MCC ground bus. Sump control panel field wires not in a conduit. Corrosion on LP & PDP wires.	1

Table 153-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
153	Laskin Road	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Control Panel	Control Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
153	Laskin Road	VFD	VFD	2	1	Corrosion	No Immediate Action Required	Bus showing signs of corrosion	1
153	Laskin Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
153	Laskin Road	SCADA	SCADA	2	1	No panel door grounding wire Terminals not labeled	No Immediate Action Required	No Comment	1
153	Laskin Road	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
153	Laskin Road	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
153	Laskin Road	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing

Not Applicable

### Laskin Rd Assets of Interest

None.

### Laskin Rd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Control panel & velocity profiler are not protected by a surge suppressor
- Equipment properly Grounded:
  - SCADA Unit, velocity profiler, & MMPS are not bonded to the station grounding system
  - Remote radiator structure is not grounded

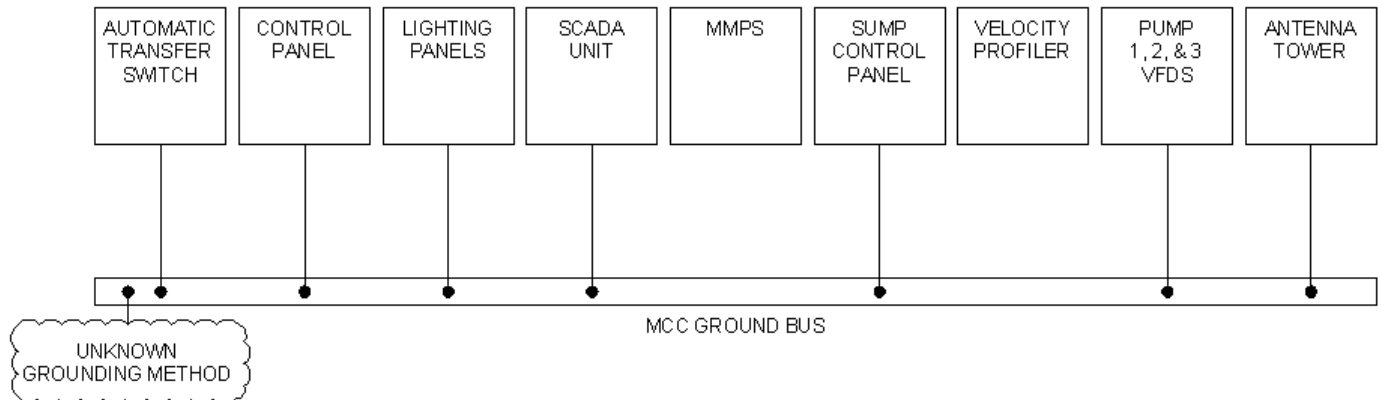


Figure 153-3. Laskin Rd Grounding System

### Laskin Rd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment



- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PRS 154 Route 337 Pressure Reducing Station

### Route 337 Facility Description

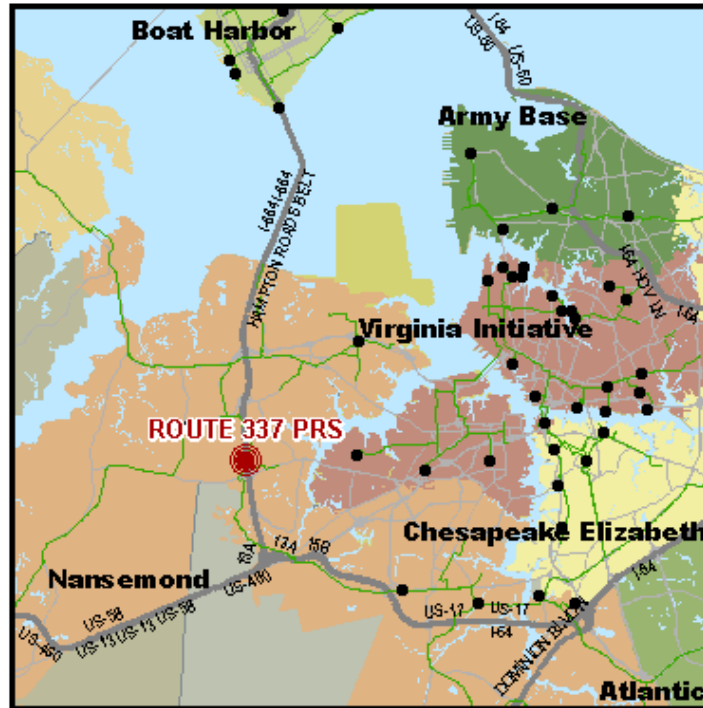


Figure 154-1. RT 337 PRS Location Map



Figure 154-2. RT 337 PRS

<b>Table 154-1. Route 337 PRS</b>	
Pumping Facility Number	154
Date of Initial Inspection	7/2/2008
Date of Update Inspection	6/9/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	7/7/2011
Date of Construction	2005
Address	2472 Gum Road, Chesapeake
Receiving Facility	Nansemond Treatment Plant
Design Head (Feet)*	73 ft. / 57.5 ft.
Firm Pumping Capacity (GPM)*	11334 GPM / 18800 GPM
Total Pumping Capacity (GPM)*	17000 GPM / 28200 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Flygt
Pump Nameplate Capacity	5667 GPM / 9400 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Flygt
Motor Nameplate Power (HP)	200
Generator Power (KW)	750

*\*Design Head, Firm Pumping Capacity and Total Pumping Capacity determined by duty points specified on pump curve*

### Route 337 Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 154-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
154	RT 337	Building	Building	2	1	Good	No Immediate Action Required	Dry well penetrations have evidence of past weeping. The perimeter fence was damaged in a 6/2011 storm. Ops reports that HRSD is accepting bids. 4 cranes are installed at the site.	1
154	RT 337	HVAC System	HVAC System	1	1	Good	No Immediate Action Required	Did not operate exhaust fan 2- appeared to be in operational condition.	1
154	RT 337	Motor 1	Wastewater Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Motor 2	Wastewater Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Motor 3	Wastewater Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Pump 1	Pump	1	1	Good	No Immediate Action Required	New pump, no nameplate. Pumps are lower limited to 20% of max speed. Cavitation and vibration observed during 2008 inspection which was attributed to low set point.	1
154	RT 337	Pump 2	Pump	1	1	Good	No Immediate Action Required	New pump, no nameplate. Pumps are lower limited to 20% of max speed. 4200 GPM at 1.9 fps. Cavitation and vibration observed during 2008 inspection which was attributed to low set point.	1
154	RT 337	Pump 3	Pump	1	1	Good	No Immediate Action Required	New pump, no nameplate. Pumps are lower limited to 20% of max speed.	1
154	RT 337	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

**Table 154-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
154	RT 337	Valves System	All Station Valves	2	1	None to Report	No Immediate Action Required	Evidence of pask leak at swing arm shafts on check valves but no leak present during site visit. 6/11: HRSD inspections indicate no problems with isolation valve operation. Check valve #2 has a closing rod which is bent and rubbing on the cushion chamber.	1
154	RT 337	Suction Isolation Valve Pump 1	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Suction Isolation Valve Pump 2	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Suction Isolation Valve Pump 3	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Check Valve Pump 2	Check Valve	4	3	See Valves System Field Observations	Schedule Corrective Action	See Valves System Comments	3
154	RT 337	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
154	RT 337	Electrical Equipment	Electrical Equipment	1	1	Good Dust Inside Panel	No Immediate Action Required	No Comment	1
154	RT 337	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Control Panel	Control Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
154	RT 337	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
154	RT 337	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
154	RT 337	SCADA	SCADA	2	1	No panel door grounding wire	No Immediate Action Required	No Comment	1

**Table 154-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
154	RT 337	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
154	RT 337	Transfer Switch	Transfer Switch	1	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No panel door grounding wire.	1
154	RT 337	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
154	RT 337	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing

Not Applicable

### Route 337 Assets of Interest

None.

### Route 337 Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Velocity profiler is not protected by a surge suppressor
- Equipment properly Grounded:
  - Pull box & MMPS are not bonded to the station grounding system
  - Remote radiator structure is not grounded

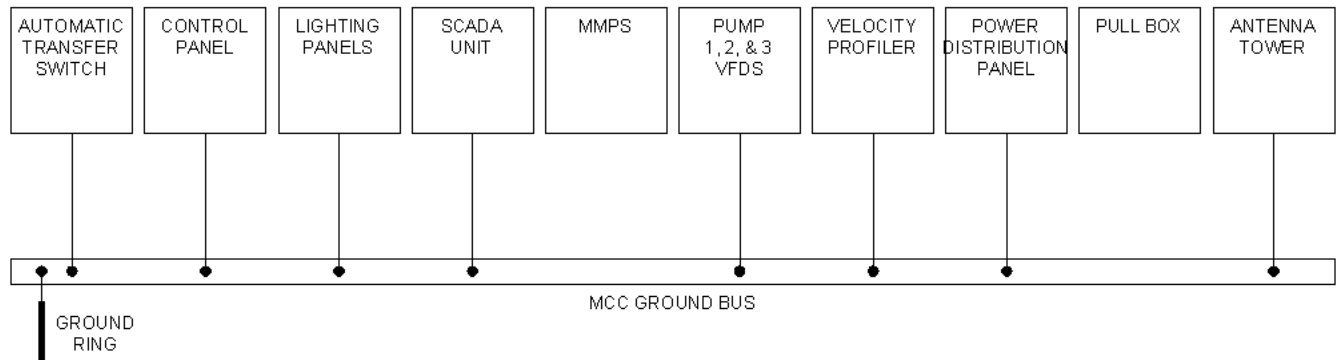


Figure 154-3. RT 337 Grounding System

### Route 337 Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged



- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 201 25<sup>th</sup> Street Pump Station

### 25<sup>th</sup> Street Facility Description



Figure 201-1. 25<sup>th</sup> Street Pump Station Location Map



Figure 201-2. 25<sup>th</sup> Street Pump Station

<b>Table 201-1. 25<sup>th</sup> St PS</b>	
Pumping Facility Number	201
Date of Initial Inspection	6/27/2008
Date of Update Inspection	6/16/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/16/2011
Date of Construction	1944
Address	11 25th Street, Newport News
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	50 ft.
Firm Pumping Capacity (GPM)	1500 GPM
Total Pumping Capacity (GPM)	3000 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1500 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric, Marathon Electric
Motor Nameplate Power (HP)	30
Generator Power (KW)	80

### 25<sup>th</sup> Street Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

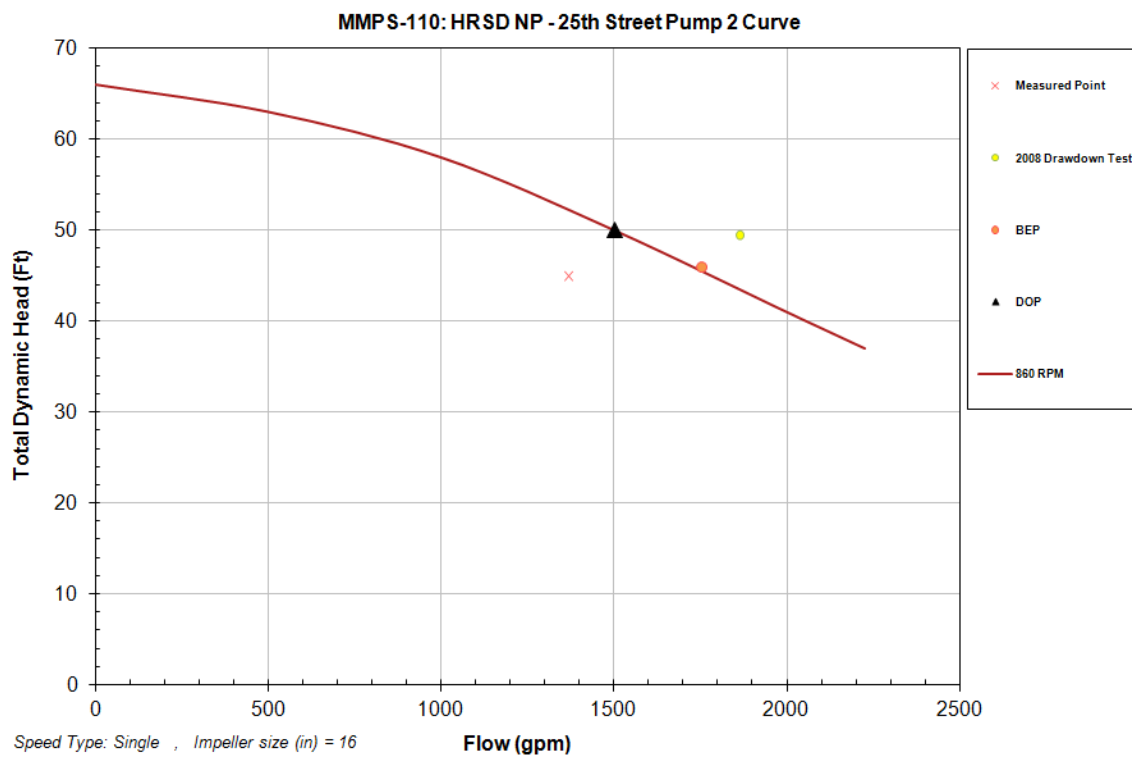
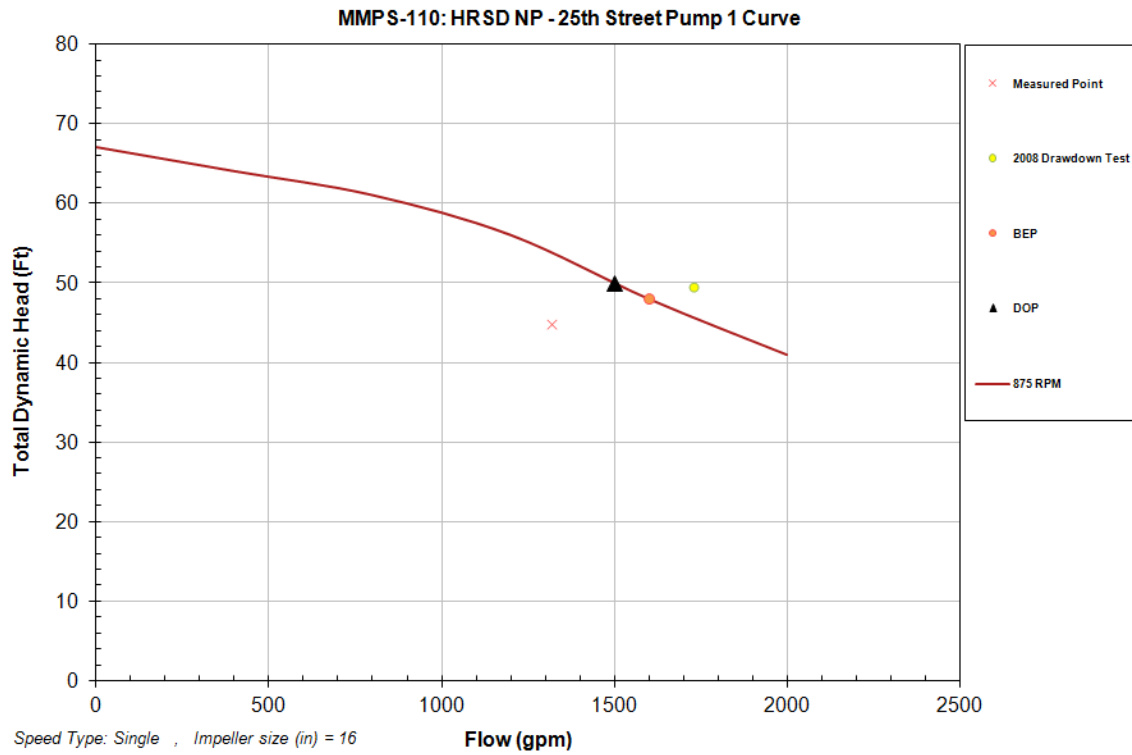
Table 201-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
201	25th Street	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
201	25th Street	HVAC System	HVAC System	2	2	Low Detectable Airflow	No Immediate Action Required	Louver is wooden and aging with no screen. Dry well ventilation weak.	1
201	25th Street	Wet well	Wet well	2	1	Concrete Corrosion	No Immediate Action Required	Wet well stairs have been replaced since last inspection. 7/2011: HRSD PM inspection on 7/13/2011 indicates some slab corrosion.	1
201	25th Street	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	strobe - 888rpm	1
201	25th Street	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 887rpm	1
201	25th Street	Pump 1	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	Vibration likely caused by shaft deflection.	1
201	25th Street	Pump 2	Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Nameplate illegible. Shaft deflection causes louder noise than pump 1. Pump pad is broken from the floor. Pad vibrates during pump operation.	1
201	25th Street	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
201	25th Street	Valves System	All Station Valves	1	1	Good	No Immediate Action Required	Check valves are 6x8" 6/11: HRSD inspections indicate no problems with isolation valve operation.	1
201	25th Street	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
201	25th Street	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
201	25th Street	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
201	25th Street	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
201	25th Street	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 201-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
201	25th Street	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
201	25th Street	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete	Continue Scheduled Maintenance Activities	MCC & ATS are aging. No door grounding wire on the ATS.	2
201	25th Street	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Autocon analog gauge/control	1
201	25th Street	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
201	25th Street	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
201	25th Street	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
201	25th Street	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled. Panel ground wire is corroded.	No Immediate Action Required	No Comment	1
201	25th Street	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
201	25th Street	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
201	25th Street	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
201	25th Street	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
201	25th Street	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
201	25th Street	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing



**25<sup>th</sup> Street Assets of Interest**

None.

**25<sup>th</sup> Street Lightning Protection Field Observations**

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Bubbler Control Panel is not protected with surge suppression
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment properly Grounded:
  - Bubbler control panel & MMPS are not properly bonded to the station grounding system

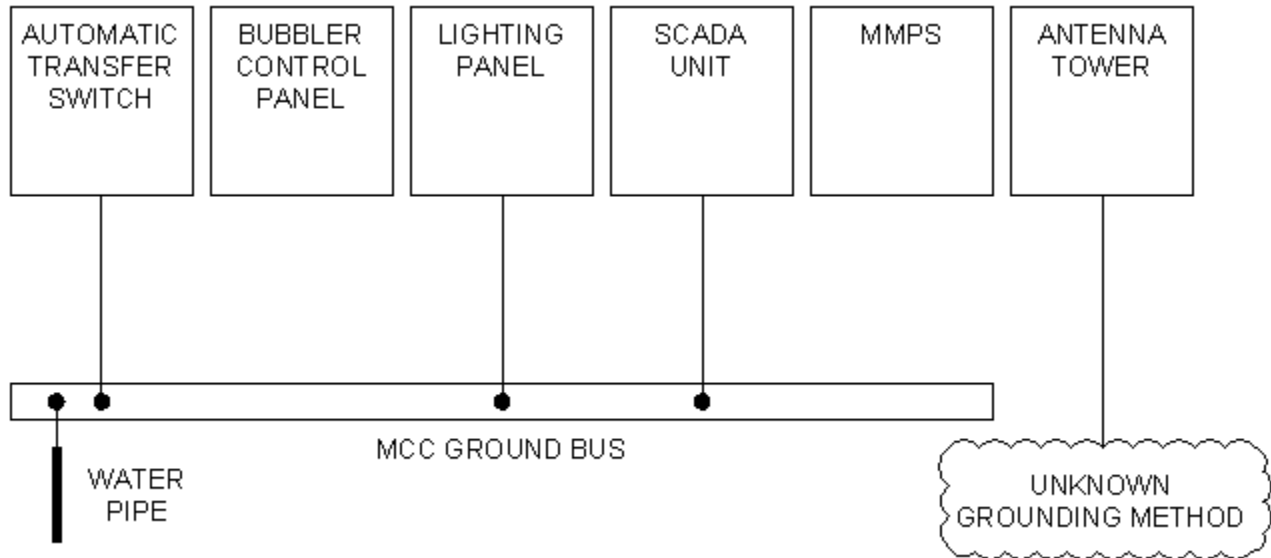


Figure 201-3. 25<sup>th</sup> St Grounding System

**25<sup>th</sup> Street Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment



- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 202 33<sup>rd</sup> Street Pump Station

### 33<sup>rd</sup> Street Facility Description



Figure 202-1. 33<sup>rd</sup> Street Pump Station Location Map

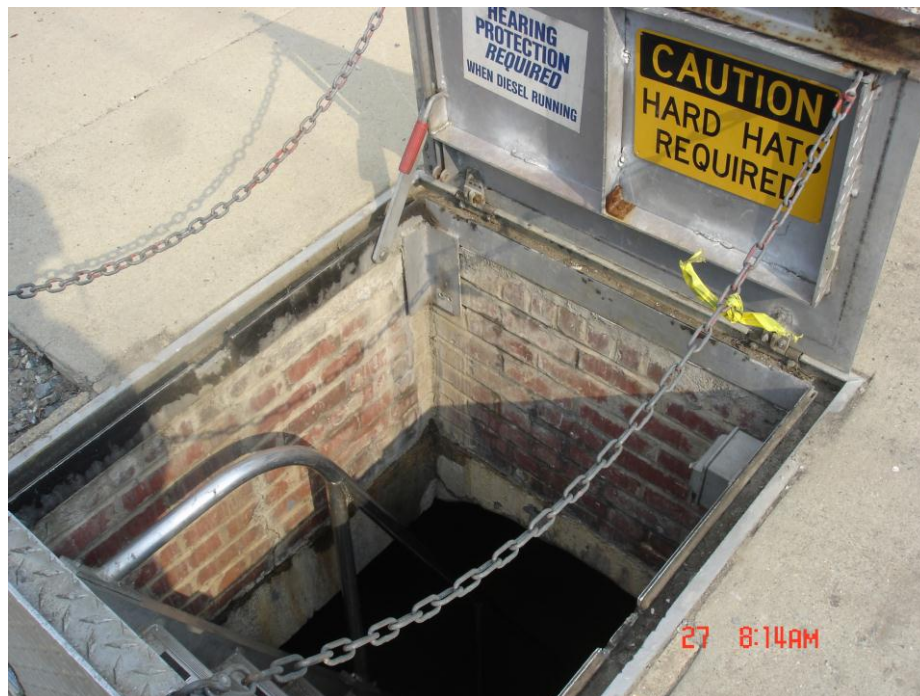


Figure 202-2. 33<sup>rd</sup> Street Pump Station

<b>Table 202-1. 33<sup>rd</sup> St PS</b>	
Pumping Facility Number	202
Date of Initial Inspection	6/27/2008
Date of Update Inspection	6/16/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/16/2011
Date of Construction	1944
Address	85 33rd Street, Newport News
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	26 ft.
Firm Pumping Capacity (GPM)	3000 GPM
Total Pumping Capacity (GPM)	6000 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Patterson
Pump Nameplate Capacity	3000 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M - Removed.
Motor Manufacturer	Westinghouse
Motor Nameplate Power (HP)	40
Generator Power (KW)	125

### 33<sup>rd</sup> Street Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

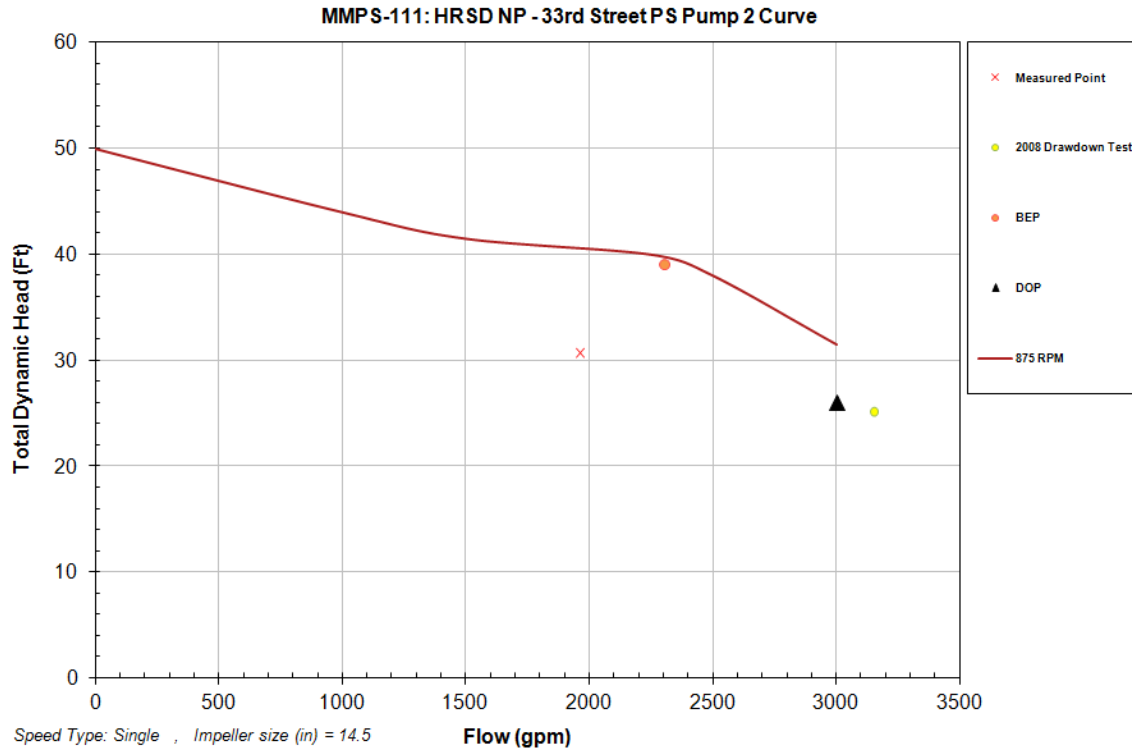
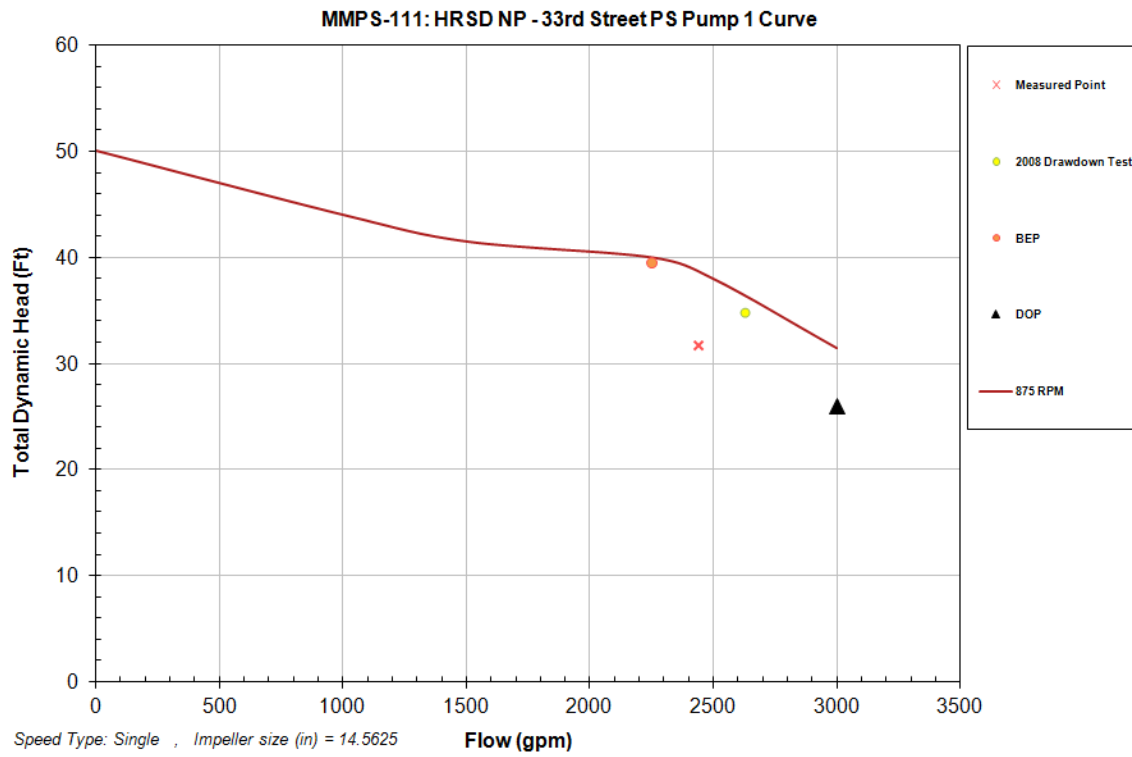
Table 202-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
202	33rd Street	Building	Building	3	1	None to Report	Continue Scheduled Maintenance Activities	Minor stormwater leak at hatch over compressor	2
202	33rd Street	HVAC System	HVAC System	2	2	Low Detectable Airflow	No Immediate Action Required	Limited air flow from dry well fan	1
202	33rd Street	Wet well	Wet well	4	3	Concrete Spalling Concrete Corrosion	Schedule Corrective Action	Underground ps, wet well in MH 7/2011: HRSD PM inspection on 6/16/2011 mentions visible aggregate throughout the wet well with 1.5" depth of corrosion on the North wall	3
202	33rd Street	Motor 1	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	strobe - 889rpm	1
202	33rd Street	Motor 2	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 890.7rpm	1
202	33rd Street	Pump 1	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Warm. Makes noise. Pump was unable to have PM performed because of valve issues. Godwin pump onsite at the time of inspection. (valves replaced since inspection - pump maintenance performed.)	2
202	33rd Street	Pump 2	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Moderate vibration likely from shaft.	2
202	33rd Street	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
202	33rd Street	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
202	33rd Street	Valves System	All Station Valves	1	1	Good	No Immediate Action Required	9/11: HRSD inspections indicate valves performing as intended. New valves were installed in 2011.	1
202	33rd Street	Suction Isolation Valve Pump 1	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
202	33rd Street	Suction Isolation Valve Pump 2	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
202	33rd Street	Check Valve Pump 1	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
202	33rd Street	Check Valve Pump 2	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 202-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
202	33rd Street	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
202	33rd Street	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
202	33rd Street	Electrical Equipment	Electrical Equipment	5	2	Good Panel Corroded Panel Obsolete Cables Fatigued and Cracked Dust Inside Panel	Schedule Corrective Action	Equipment is corroded	3
202	33rd Street	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Autocon analog gauge/control	2
202	33rd Street	Bubbler Panel	Bubbler Panel	4	2	No panel door grounding wire is installed	Schedule Corrective Action	Equipment should be monitored consistently due to the corrosive environment.	3
202	33rd Street	Compressor	Compressor	3	2	None to Report	Continue Scheduled Maintenance Activities	No Comment	2
202	33rd Street	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
202	33rd Street	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled. Panel ground wire is corroded.	No Immediate Action Required	No Comment	1
202	33rd Street	Velocity Profiler	Velocity Profiler	1	1	Panel ground wire has fallen from it's terminal.	No Immediate Action Required	No Comment	1
202	33rd Street	Transfer Switch	Transfer Switch	4	2	Switch Corroded	Schedule Corrective Action	Panel Corroded	3
202	33rd Street	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Installed outside of structure after previous generator fire.	1
202	33rd Street	Generator	Generator	2	1	Good	No Immediate Action Required	Installed outside station after previous generator fire.	1
202	33rd Street	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1
202	33rd Street	Tank 1	Fuel Tank	2	1	Good	No Immediate Action Required	Belly tank	1

### Draw-Down Testing





### 33<sup>rd</sup> Street Assets of Interest

33<sup>rd</sup> St pump station is scheduled for action as part of the Interim System Improvements. After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the 33<sup>rd</sup> St wet well is deteriorating.



Figure 202-3. 33<sup>rd</sup> St Wet Well

There is corrosion present on the electrical equipment.



Figure 202-4. 33<sup>rd</sup> St Transfer Switch





Figure 202-5. 33<sup>rd</sup> St Junction Box

### 33<sup>rd</sup> Street Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel & velocity profiler are not protected by a surge suppressor
- Equipment properly Surge Protected:
  - Motor starters & MMPS are not bonded to the station grounding system

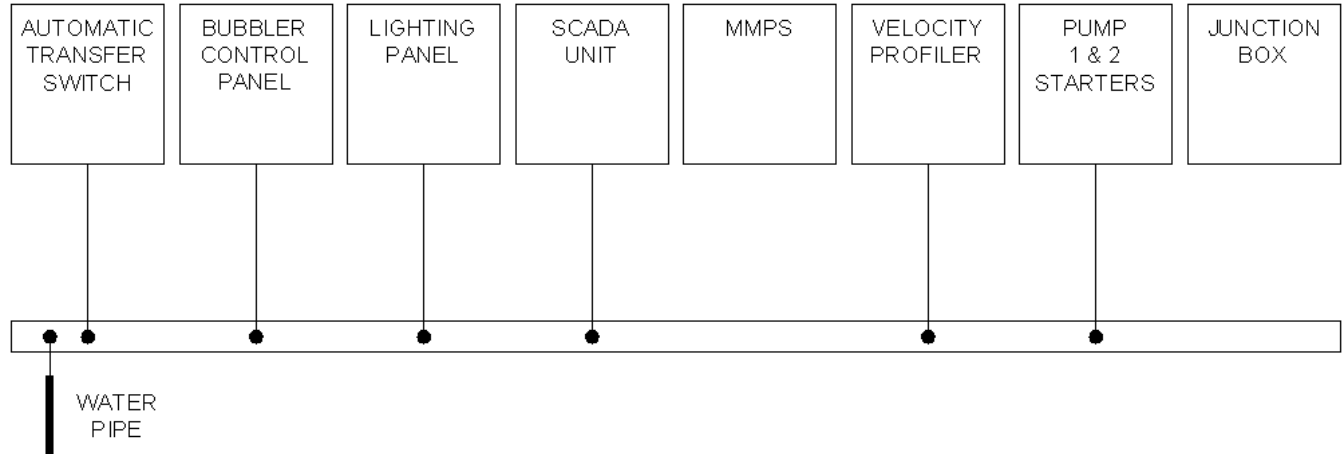


Figure 202-6. 33<sup>rd</sup> St Grounding System

### 33<sup>rd</sup> Street Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 203 Bay Shore Lane Pump Station

### Bay Shore Lane Facility Description

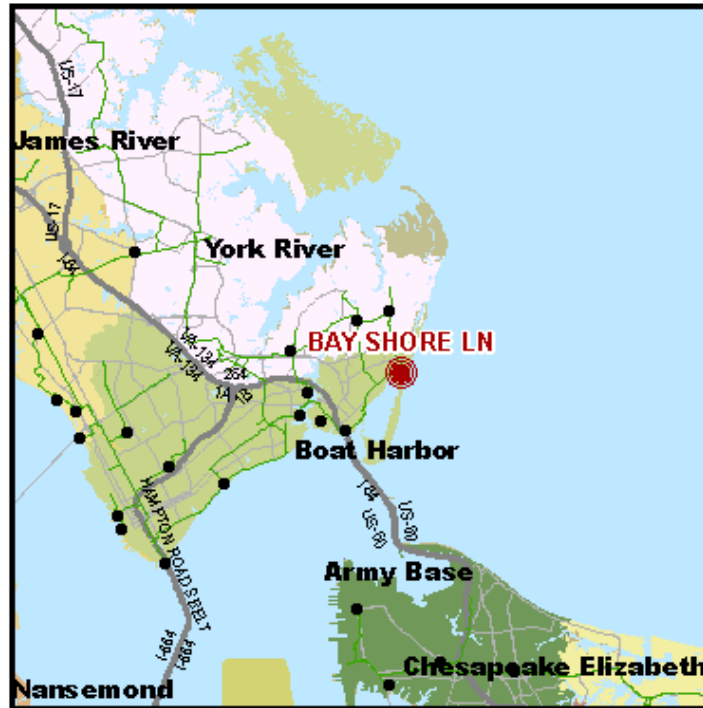


Figure 203-1. Bay Shore Lane Pump Station Location Map



Figure 203-2. Bay Shore Lane Pump Station

<b>Table 203-1. Bay Shore Lane PS</b>	
Pumping Facility Number	203
Date of Initial Inspection	6/25/2008
Date of Update Inspection	6/27/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1946
Address	720 Bay Shore Lane, Hampton
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)*	20 ft., 40 ft. / 65 ft.
Firm Pumping Capacity (GPM)*	1200 GPM / 2475 GPM
Total Pumping Capacity (GPM)*	2400 GPM / 4950 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1500 GPM ; 1200 / 2475 GPM, 1200 / 2475 GPM,
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric
Motor Nameplate Power (HP)	20, 40, 40
Generator Power (KW)	100

\* Pump Card; Station has two wet weather duty pumps.

### Bay Shore Lane Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

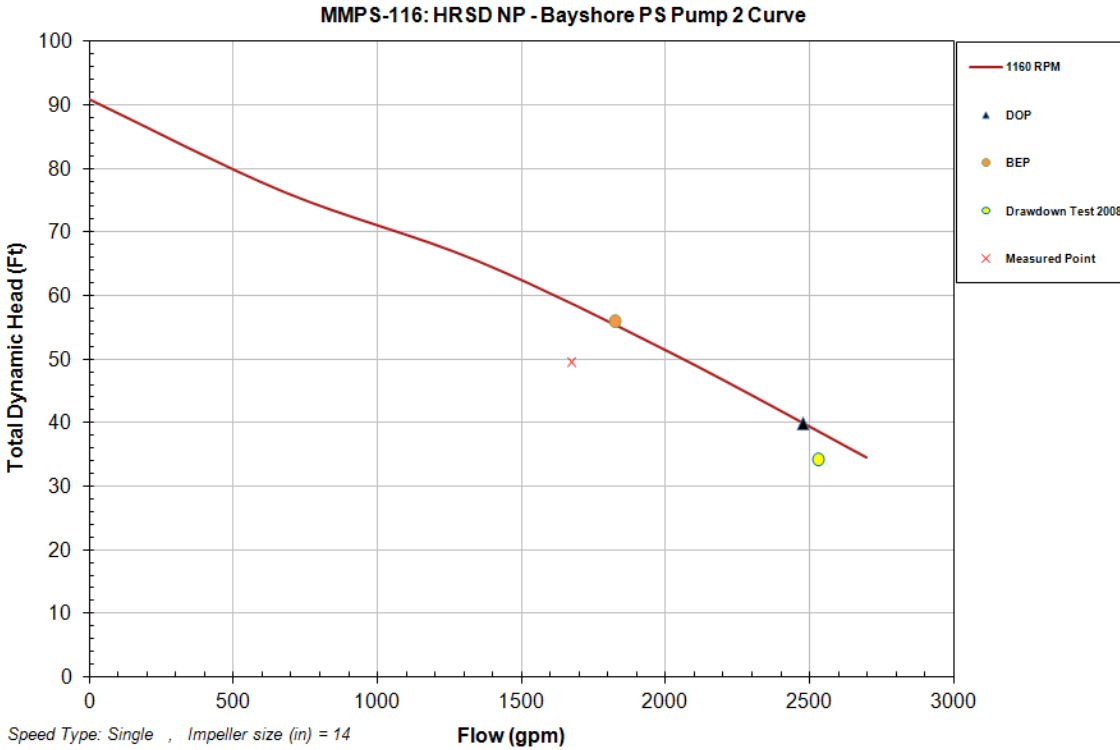
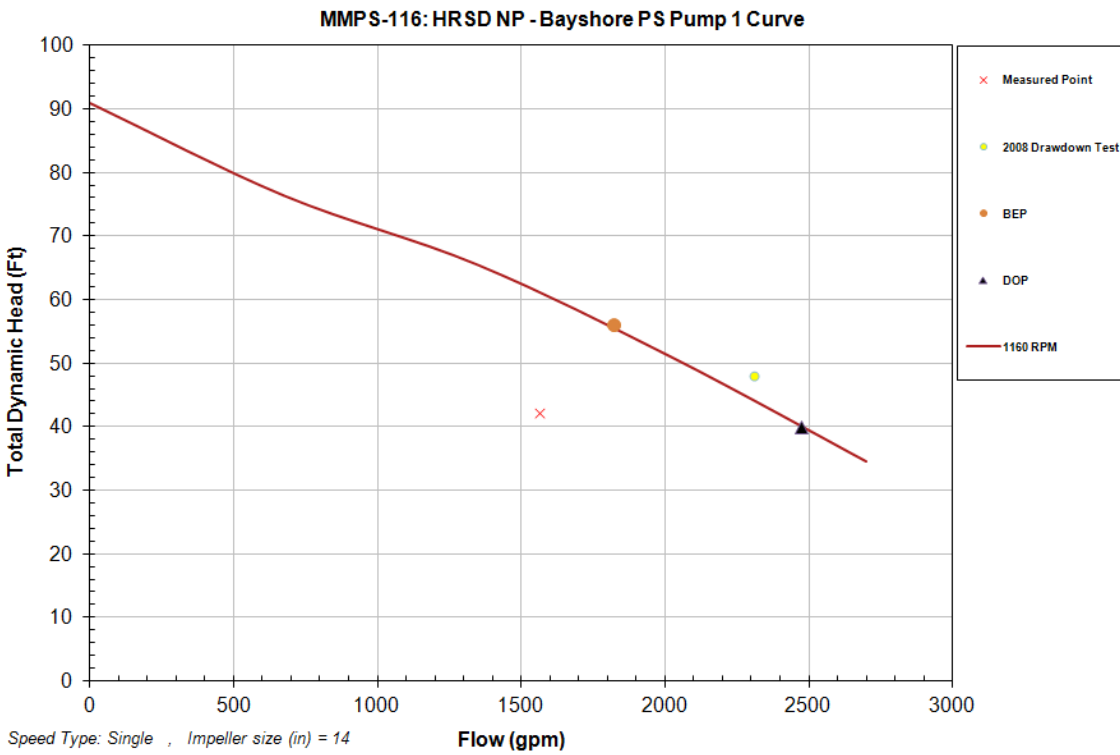
Table 203-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
203	Bay Shore	Building	Building	2	2	Good Doors and Security Failing	No Immediate Action Required	Barbed wire is broken. Asbestos roof.	1
203	Bay Shore	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well fan makes noise; weak.	1
203	Bay Shore	Wet well	Wet well	3	2	Good Concrete Corrosion	Continue Scheduled Maintenance Activities	Rehabilitated in 2001-2002. 7/2011: HRSD PM inspection on 3/11/2011 (wet well pictures available) shows projecting aggregate above the sluice gate.	2
203	Bay Shore	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	Replaced summer 2011.	1
203	Bay Shore	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
203	Bay Shore	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
203	Bay Shore	Motor 3	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Variable speed rated. Operating at 50 Hz on arrival.	1
203	Bay Shore	Pump 1	Pump	3	3	Vibrating Cavitating	Continue Scheduled Maintenance Activities	Moderate vibration, possible debris in pump. Shaft clangs on startup. Pump made noises. Flow meter: 1070 gpm, 2.1 fps Pump has priming issues - Ops had to ensure prime before leaving station.	2
203	Bay Shore	Pump 2	Pump	3	3	Vibrating Cavitating	Continue Scheduled Maintenance Activities	Moderate vibration, possible debris in pump. Pump made noises. Flow meter: 1000 gpm, 2.0 fps Pump has priming issues - Ops had to ensure prime before leaving station.	2
203	Bay Shore	Pump 3	Pump	3	2	Vibrating	Continue Scheduled Maintenance Activities	Nameplate illegible. Only pump on VFD - always in lead. Flow meter: 410 gpm, 0.8 fps.	2
203	Bay Shore	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

Table 203-2. Pumping Facility Asset Condition and Performance Ratings

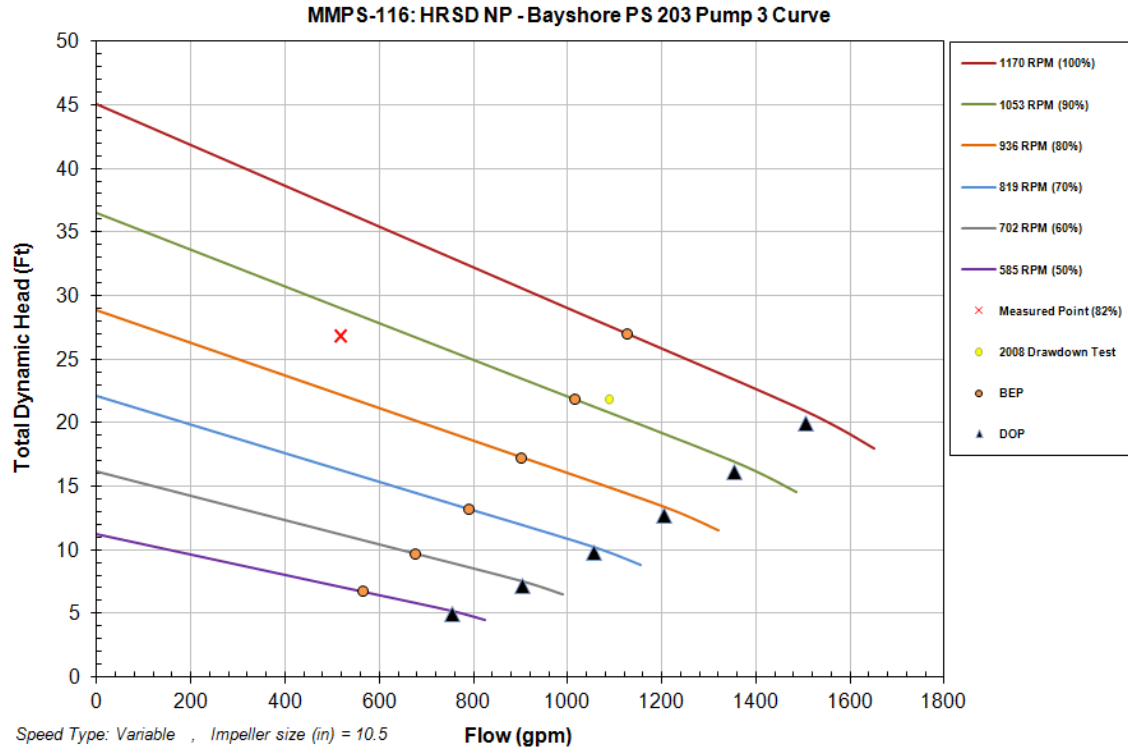
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
203	Bay Shore	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Pipe supports for check valves #2 and #3 are corroding. 7/11: HRSD inspections indicate #1 suction and #3 discharge isolation valves are tight in operation.	1
203	Bay Shore	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
203	Bay Shore	Electrical Equipment	Electrical Equipment	4	3	Good Panel Obsolete Switch Gear Worn	Schedule Corrective Action	MCC needs to be replaced; evidence of previous fire. VFD is in good condition.	3
203	Bay Shore	Instrumentation System	Instrumentation System	3	2	Good	Continue Scheduled Maintenance Activities	No Comment	2
203	Bay Shore	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed. Construction was in progress during site visit.	Continue Scheduled Maintenance Activities	No Comment	2
203	Bay Shore	VFD	VFD	2	1	VFD is not bonded to ground	No Immediate Action Required	No Comment.	1
203	Bay Shore	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
203	Bay Shore	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

Table 203-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
203	Bay Shore	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled.	No Immediate Action Required	No Comment	1
203	Bay Shore	Transfer Switch	Transfer Switch	3	2	Unable to shut down equipment, crew was working in the well.	Continue Scheduled Maintenance Activities	No Comment	2
203	Bay Shore	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
203	Bay Shore	Generator	Generator	3	4	Good	Corrective Action Required	Mfr - Newage Stamford. Overheated during preventive maintenance.	4
203	Bay Shore	Batteries and Charger	Batteries and Charger	3	2	Good Contacts Corroded	Continue Scheduled Maintenance Activities	Batteries are Americad HED-10. Asset size not known. Contacts are not properly protected.	2
203	Bay Shore	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
203	Bay Shore	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

## Draw-Down Testing







### Bay Shore Lane Assets of Interest

The Bay Shore Lane generator overheated during station preventive maintenance activities. The Motor Control Center (MCC) is deteriorating and shows evidence of a previous fire.



Figure 203-3. Bay Shore Lane Generator



Figure 203-4. Bay Shore Lane MCC

### Bay Shore Lane Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Bubbler control panel is not protected with surge suppression
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment properly Grounded:
  - Bubbler control panel & MMPS are not properly bonded to the station grounding system

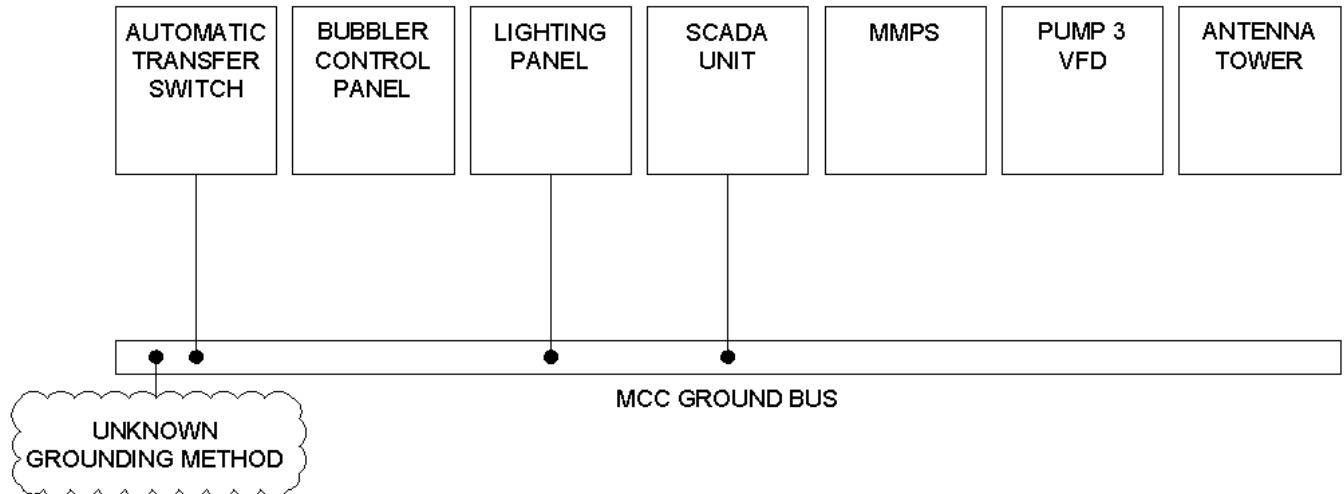


Figure 203-5. Bay Shore Lane Grounding System

### Bay Shore Lane Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly

- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - MCC needs to be replaced

## PS 204 Bloxoms Corner Pump Station

### Bloxoms Corner Facility Description



Figure 204-1. Bloxoms Corner Pump Station Location Map



Figure 204-2. Bloxoms Corner Pump Station

<b>Table 204-1. Bloxoms Corner PS</b>	
Pumping Facility Number	204
Date of Initial Inspection	6/25/2008
Date of Update Inspection	6/27/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1966
Address	5 Beach Rd, Hampton
Receiving Facility	York River Treatment Plant
Design Head (Feet)	30 ft.
Firm Pumping Capacity (GPM)	520 GPM
Total Pumping Capacity (GPM)	1040 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	520 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	8
Generator Power (KW)	None

### **Bloxoms Corner Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 204-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
204	Bloxoms Corner	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
204	Bloxoms Corner	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Motor room passive ventilation only. Dry well ventilation felt weak.	1
204	Bloxoms Corner	Wet well	Wet well	4	3	Concrete Spalling Concrete Corrosion	Schedule Corrective Action	Minor spalling. 7/2011: HRSD PM inspection on 4/13/2011 indicates visible aggregate throughout wet well with the concrete condition assessed as poor.	3
204	Bloxoms Corner	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 1186 RPM.	1
204	Bloxoms Corner	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 1186 RPM	1
204	Bloxoms Corner	Pump 1	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Slight shaft deflection which is likely causing slight observed pump vibration. No nameplate data visible. Air blow off valve is open all the time. Pumps cycle frequently. Flow meter may need servicing; reading for pump 1 could not be obtained.	2
204	Bloxoms Corner	Pump 2	Pump	2	1	Good	No Immediate Action Required	No nameplate data visible. Flow meter: 2.9 fps, 500 gpm Air blow off valve is open all the time. Pumps cycle frequently.	1
204	Bloxoms Corner	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	Dry Well.	1
204	Bloxoms Corner	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	Meter vault sump pump.	1
204	Bloxoms Corner	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate that #1 discharge valve is in fair condition.	1
204	Bloxoms Corner	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
204	Bloxoms Corner	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

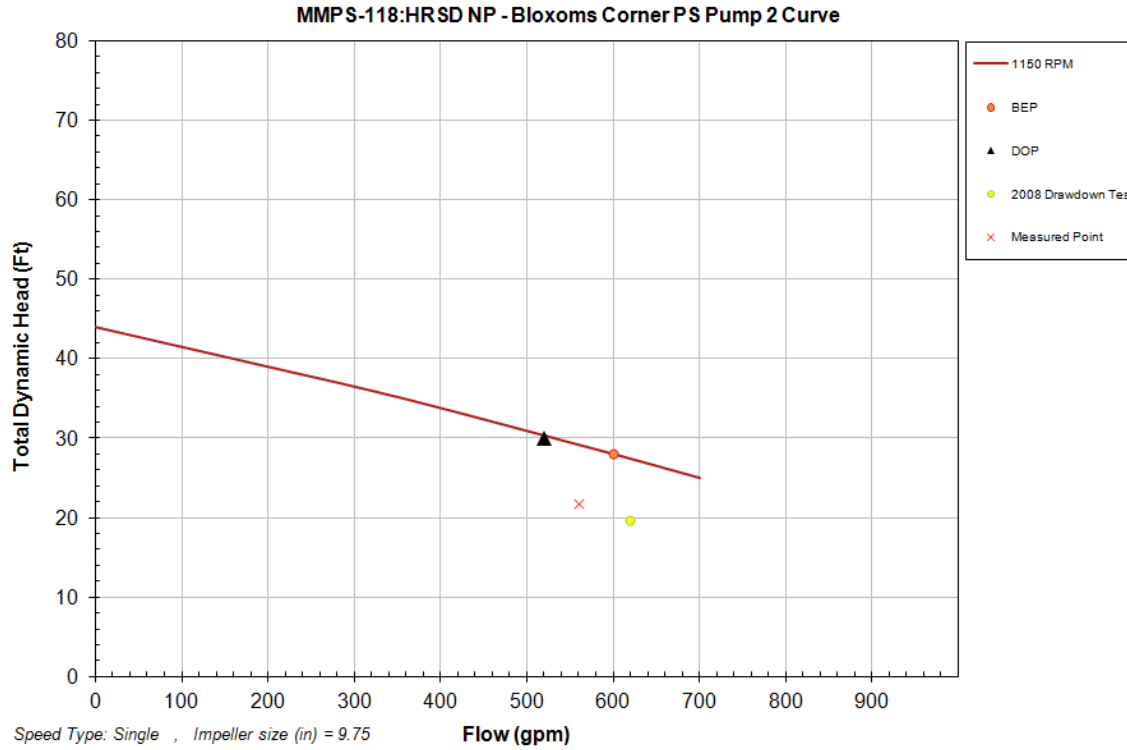
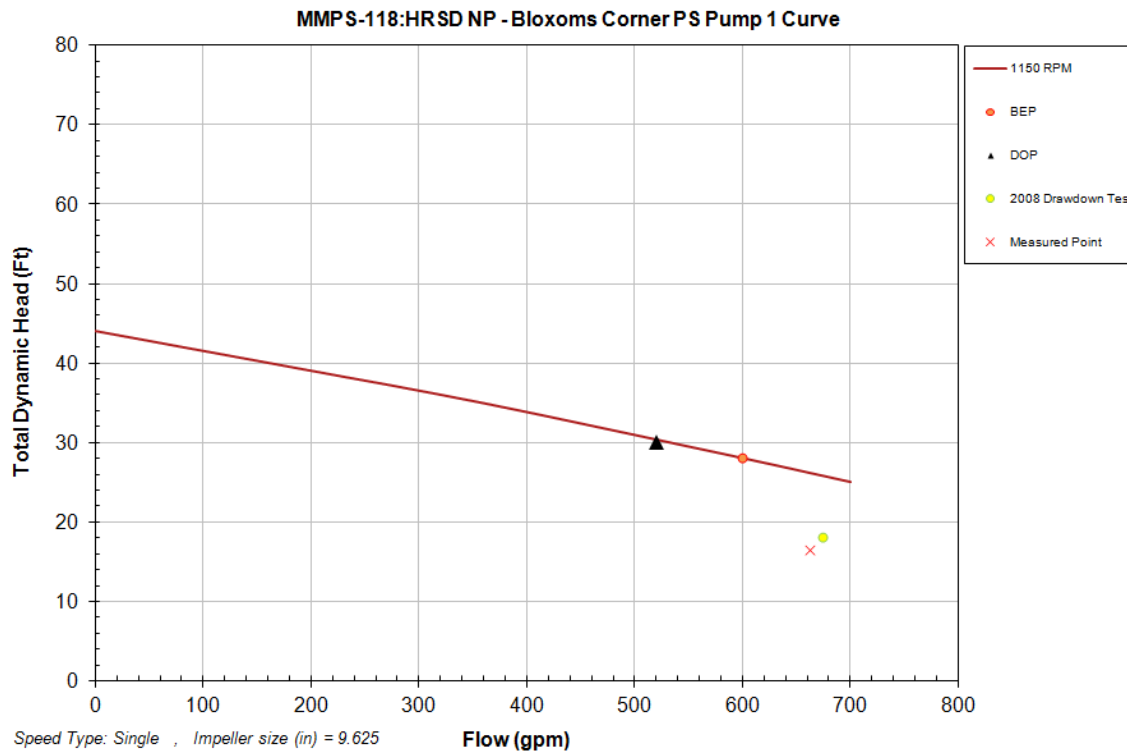


**Table 204-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
204	Bloxoms Corner	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
204	Bloxoms Corner	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
204	Bloxoms Corner	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
204	Bloxoms Corner	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
204	Bloxoms Corner	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	Alternate power feed instead of standby generator. Other electrical assets good. No panel door ground wires,	1
204	Bloxoms Corner	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
204	Bloxoms Corner	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
204	Bloxoms Corner	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
204	Bloxoms Corner	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	Flow meter may need servicing; reading for pump 1 could not be obtained during pump inspection.	1
204	Bloxoms Corner	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1
204	Bloxoms Corner	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	No Comment	1



### Draw-Down Testing



### Bloxoms Corner Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Bloxoms Corner wet well is deteriorating.



Figure 204-3. Bloxoms Corner Wet Well

### Bloxoms Corner Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system

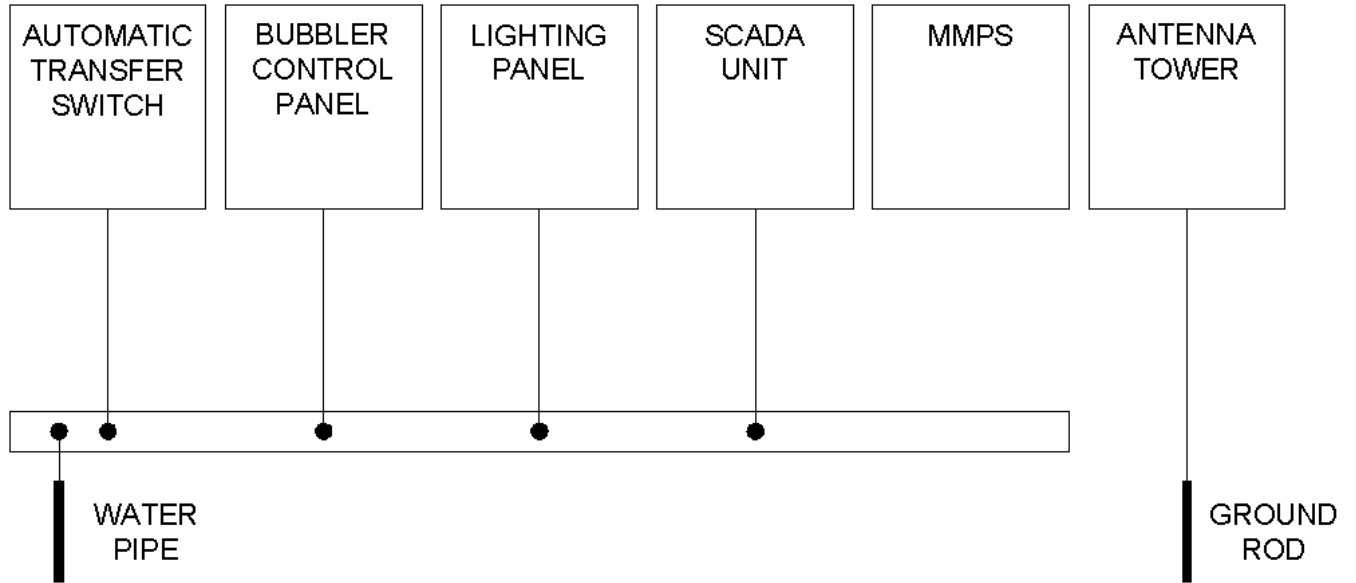


Figure 204-4. Bloxoms Corner Grounding System

**Bloxoms Corner Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion

- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator

### **Bloxoms Corner Dual Power Feed Assessment**

Information obtained from the local electrical utility indicates that this station has redundant transformers each with a different circuit feeding it from the utility. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.

## PRS 205 Big Bethel Pressure Reducing Station

### Big Bethel Facility Description



Figure 205-1. Big Bethel PRS Location Map



Figure 205-2. Big Bethel PRS

<b>Table 205-1. Big Bethel PRS</b>	
Pumping Facility Number	205
Date of Initial Inspection	6/20/2008
Date of Update Inspection	6/27/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/10/2011
Date of Construction	1971
Address	1431 Big Bethel Rd, Hampton
Receiving Facility	York River Treatment Plant
Design Head (Feet)	70 ft.
Firm Pumping Capacity (GPM)	12240 GPM
Total Pumping Capacity (GPM)	16320 GPM
Number of Pumps	4
Pump Type	Centrifugal
Pump Manufacturer	Allis Chalmers
Pump Nameplate Capacity	4080 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Marathon Electric
Motor Nameplate Power (HP)	125
Generator Power (KW)	None

### Big Bethel Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 205-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
205	Big Bethel PRS	Building	Building	2	1	Good	No Immediate Action Required	Discharge link seal leaking. 2 ton crane. Recently replaced yard piping - old valve guide posted.	1
205	Big Bethel PRS	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No ventilation duct, 2 exhaust fans and 2 louvers.	1
205	Big Bethel PRS	Motor 1	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	Top end noise related to rotation - doesn't sound indicative of failure. Lead at time of inspection pump along with #2, 410 rpm on arrival.	1
205	Big Bethel PRS	Motor 2	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	Lead at time of inspection pump along with #1, 405 rpm on arrival.	1
205	Big Bethel PRS	Motor 3	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Motor 4	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Pump 1	Pump	2	2	Good	No Immediate Action Required	Pump made noises.	1
205	Big Bethel PRS	Pump 2	Pump	2	2	Vibrating	No Immediate Action Required	Vibration in upper portion of pump. Pump made noise.	1
205	Big Bethel PRS	Pump 3	Pump	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Pump 4	Pump	2	1	Good	No Immediate Action Required	Ops reports pump is never in lead by itself as it will cavitate which is apparently caused by its location on the suction header. No cavitation heard during test. Pump made noise which may be from the shaft.	1
205	Big Bethel PRS	Pump	Sewage Pump	3	1	None to Report	Continue Scheduled Maintenance Activities	Pump for bathroom at station - has some corrosion.	2
205	Big Bethel PRS	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRS D inspections indicate no problems with isolation valve operation.	1
205	Big Bethel PRS	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1



Table 205-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
205	Big Bethel PRS	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Check Valve Pump 4	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
205	Big Bethel PRS	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Control Panel	Control Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	SCADA	SCADA	3	2	No panel door grounding wire. Terminals not labeled.	Continue Scheduled Maintenance Activities	No Comment	2
205	Big Bethel PRS	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Engine	Generator Drive Engine	2	1	Good Leaking Fluids	No Immediate Action Required	No nameplate. Minor oil leak.	1
205	Big Bethel PRS	Generator	Generator	2	1	Good	No Immediate Action Required	No nameplate	1



Table 205-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
205	Big Bethel PRS	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	20 max for charger. Contacts are not properly protected.	1
205	Big Bethel PRS	Tank 1	Sewage Tank	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Tank 2	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
205	Big Bethel PRS	Tank 3	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing

Not Applicable

### Big Bethel Assets of Interest

None.

### Big Bethel Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Control panel & velocity profiler are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system

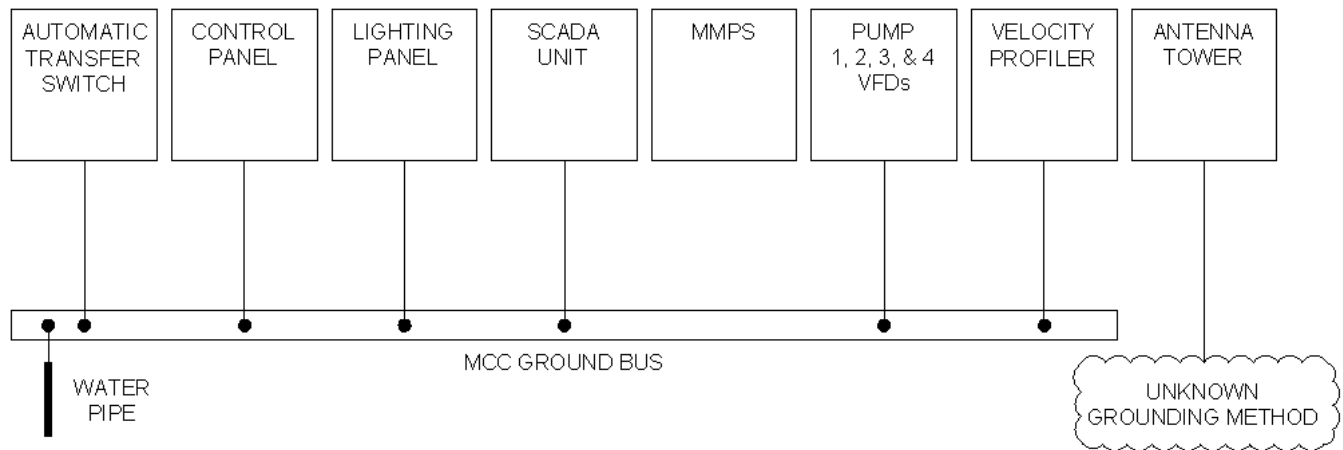


Figure 205-3. Big Bethel Grounding System

### Big Bethel Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)

- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 206 Bridge Street Pump Station

### Bridge Street Facility Description



Figure 206-1. Bridge Street Pump Station Location Map



Figure 206-2. Bridge Street Pump Station

<b>Table 206-1. Bridge St PS</b>	
Pumping Facility Number	206
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/27/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1945
Address	4701 Victoria Blvd, Hampton
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	96 ft. / 25 ft.
Firm Pumping Capacity (GPM)	4200 GPM / 10900 GPM
Total Pumping Capacity (GPM)	6300 GPM / 16350 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	2100 GPM / 5450 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	190
Generator Power (KW)	500

### Bridge Street Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 206-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
206	Bridge St	Building	Building	2	1	Good	No Immediate Action Required	Building is aging. Scrubber has a relatively new fence. 13 ton crane. Dry well has 2x 5 ton cranes	1
206	Bridge St	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation weak. There is an oscillating fan in the dry well to help dissipate motor heat. 2-stage scrubber onsite. Carbon tank added after caustic to provide an additional treatment process.	1
206	Bridge St	Wet well	Wet well	2	1	Good	No Immediate Action Required	Wet well was rehabilitated in 2007 8/2011: HRSD PM inspection on 8/22/11 indicates some minor degradation.	1
206	Bridge St	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
206	Bridge St	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Recently replaced controller.	1
206	Bridge St	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Recently replaced controller. Lead pump day of test - 30 Hz Top of motor hot.	1
206	Bridge St	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Recently replaced controller.	1
206	Bridge St	Motor	Pump Room Fan Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Motor	Caustic Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Motor	Blower Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Pump 1	Wastewater Pump	2	2	Good	No Immediate Action Required	Pump made noise	1
206	Bridge St	Pump 2	Wastewater Pump	2	1	Good	No Immediate Action Required	Top and terminal bearing replaced in November 2007	1

**Table 206-2. Pumping Facility Asset Condition and Performance Ratings**

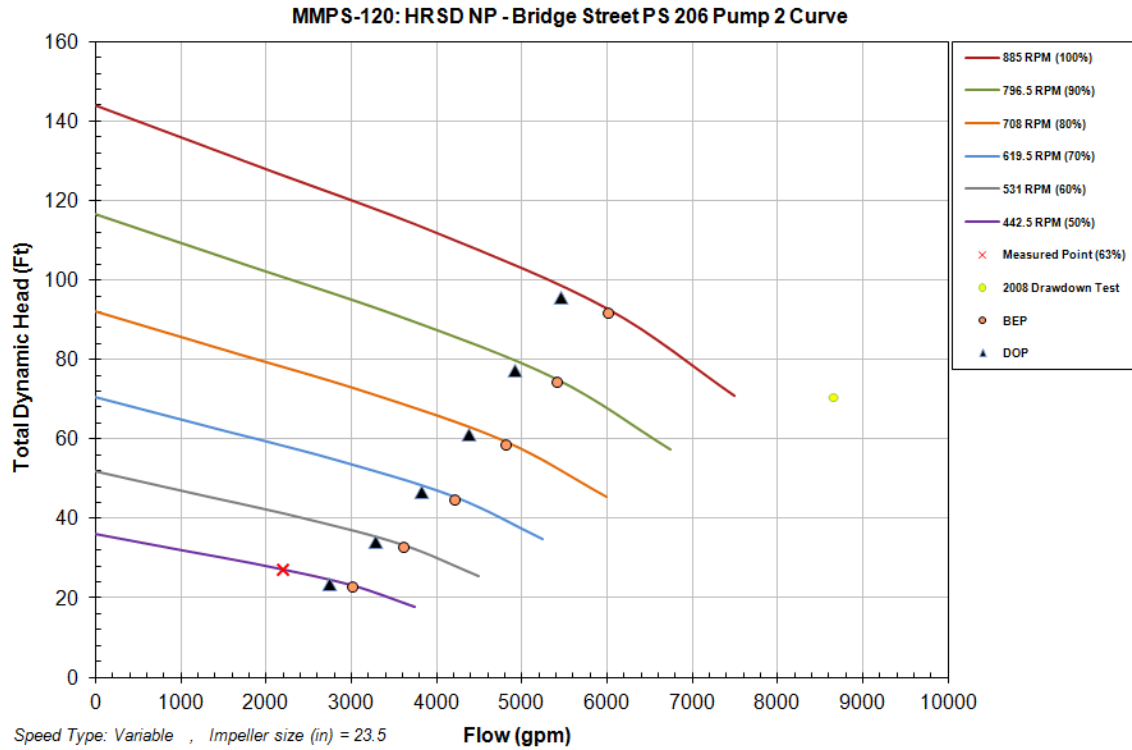
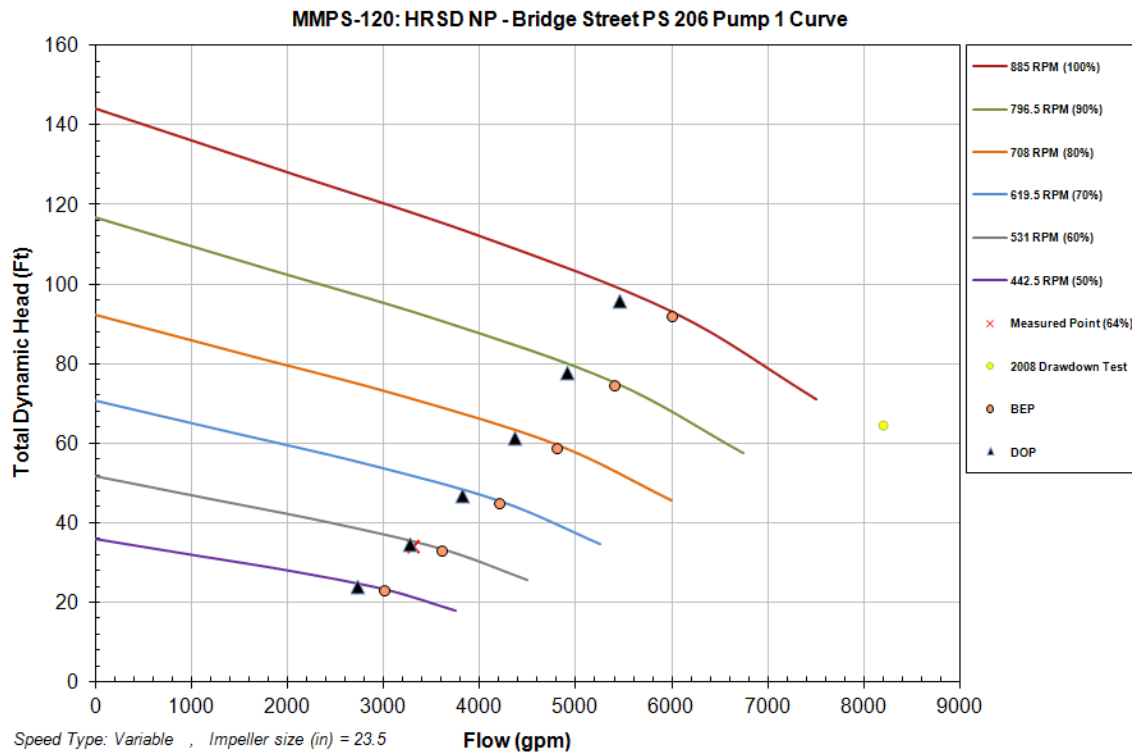
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
206	Bridge St	Pump 3	Wastewater Pump	2	3	Good	Continue Scheduled Maintenance Activities	Top bearing and endbell serviced in April 2003. Not primed when test began. Ops took several minutes to get the pump operational. Pump sounded good when it began running.	2
206	Bridge St	Pump	Sump Pump	1	1	Good	No Immediate Action Required	Caustic room.	1
206	Bridge St	Pump	Chemical Feed Pump	1	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Pump	Recirculation Pump	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Dry well	1
206	Bridge St	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Generator louver area.	1
206	Bridge St	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Exhaust fan louver area.	1
206	Bridge St	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Discharge #3 bubbling. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
206	Bridge St	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
206	Bridge St	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
206	Bridge St	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
206	Bridge St	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
206	Bridge St	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
206	Bridge St	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
206	Bridge St	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
206	Bridge St	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

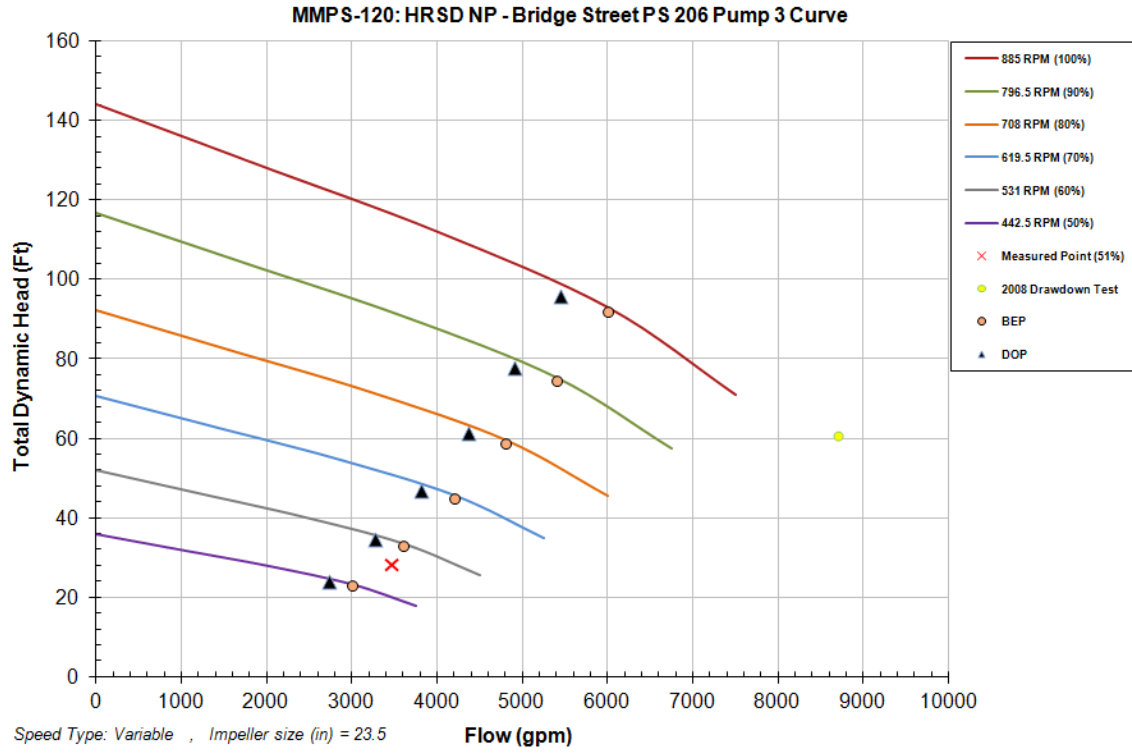


**Table 206-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
206	Bridge St	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
206	Bridge St	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Bubbler Panel	Bubbler Panel	2	1	None to Report	No Immediate Action Required	No Comment	1
206	Bridge St	VFD	VFD	2	1	None to Report	No Immediate Action Required	No Comment	1
206	Bridge St	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
206	Bridge St	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
206	Bridge St	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled.	No Immediate Action Required	No Comment	1
206	Bridge St	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
206	Bridge St	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Contacts are not properly protected.	1
206	Bridge St	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Tank 2	Scrubber Tank	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Tank 3	Chemical Tank	2	1	Good	No Immediate Action Required	No Comment	1
206	Bridge St	Tank 4	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Bridge Street Assets of Interest

None.

### Bridge Street Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel & scrubber room panels are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system

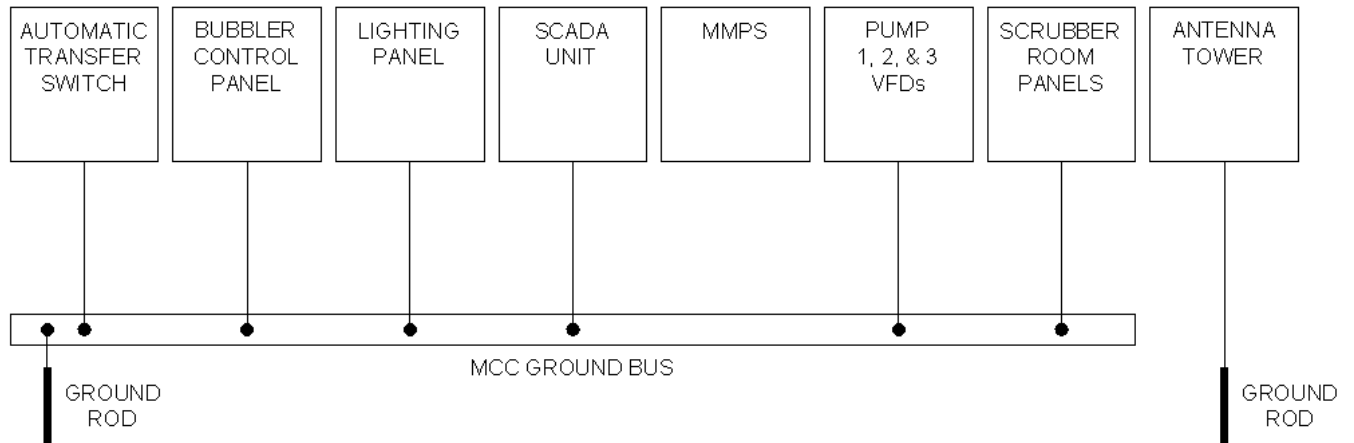


Figure 206-3. Bridge St Grounding System

### Bridge Street Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available

- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 207 Center Ave Pump Station

### Center Ave Facility Description



Figure 207-1. Center Ave Pump Station Location Map



Figure 207-2. Center Ave Pump Station

**Table 207-1. Center Ave PS**

<b>Pumping Facility Number</b>	<b>207</b>
<b>Date of Initial Inspection</b>	<b>6/30/2008</b>
<b>Date of Update Inspection</b>	<b>6/16/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>8/4/2011</b>
<b>Date of Construction</b>	<b>1946</b>
<b>Address</b>	<b>315 Center Ave, Newport News</b>
<b>Receiving Facility</b>	<b>James River Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>42 ft., 70 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>4775 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>8375 GPM</b>
<b>Number of Pumps</b>	<b>3</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>1400 GPM, 3375 GPM, 3600 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>8" Godwin CD225M</b>
<b>Motor Manufacturer</b>	<b>General Electric, Alliss Chalmers, Marathon Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>25, 81, 100</b>
<b>Generator Power (KW)</b>	<b>200</b>

### Center Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



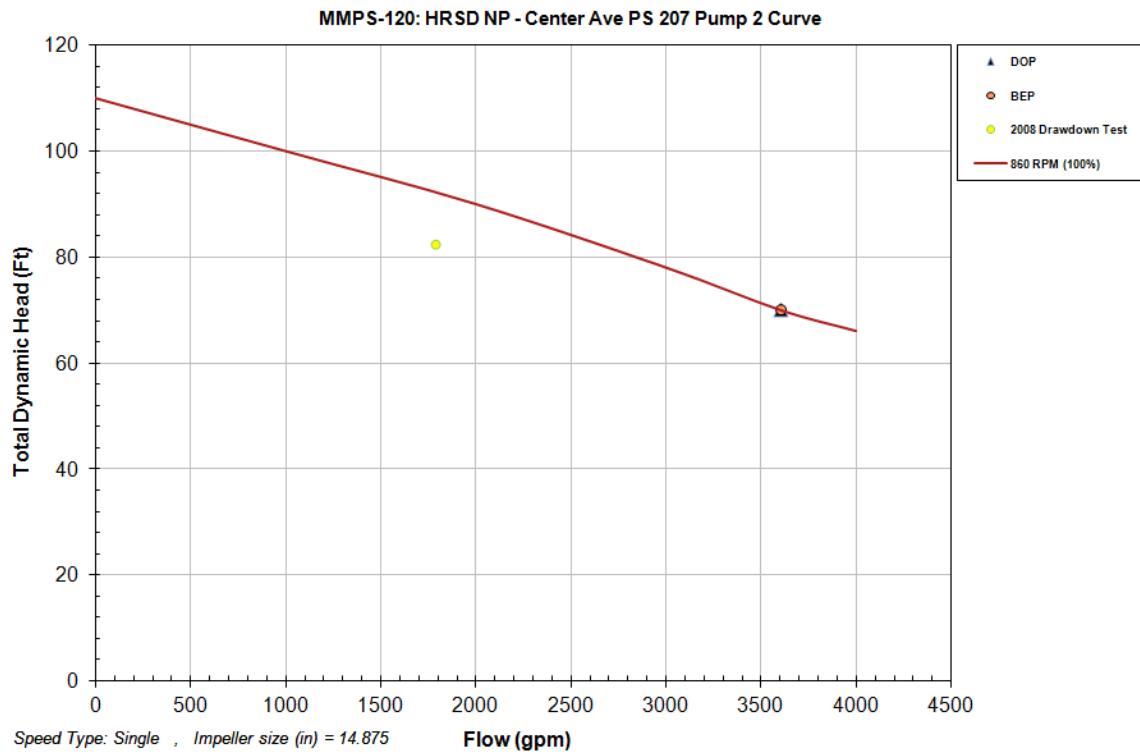
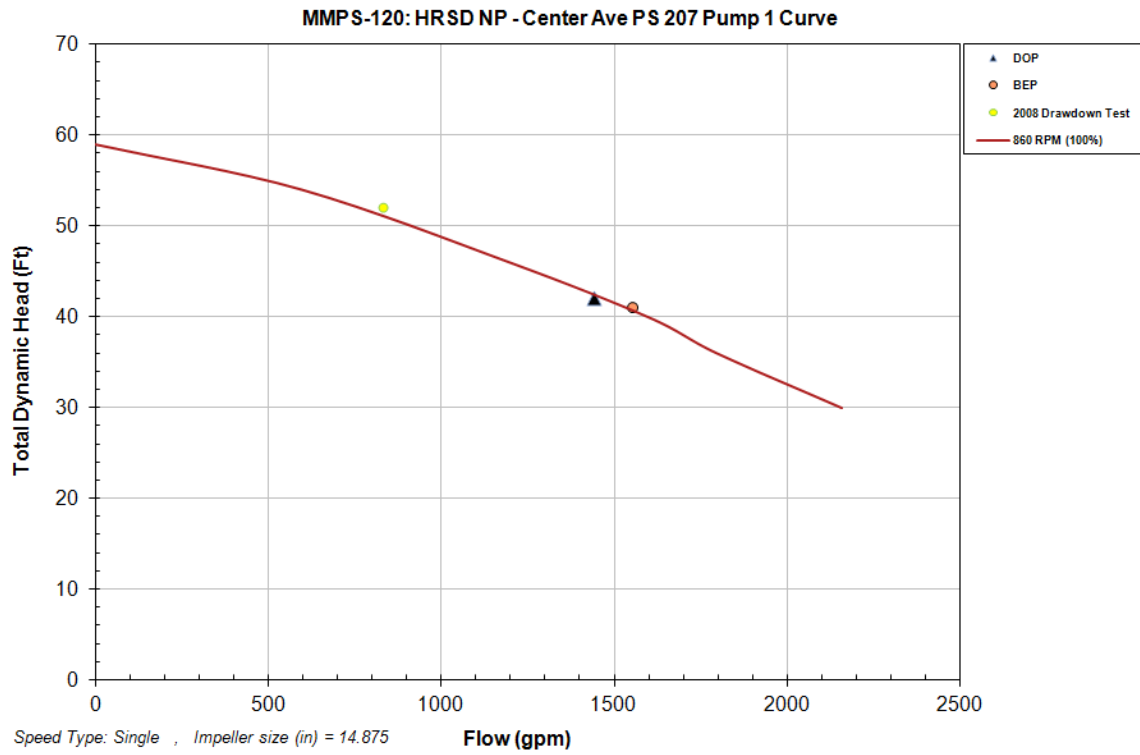
Table 207-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
207	Center Ave	Building	Building	3	2	Good	Continue Scheduled Maintenance Activities	Station to be replaced. This station has a designed overflow which discharges to a ditch which flows to the the James River. There is a CD 225 Godwin Pump onsite as a standby pump.	2
207	Center Ave	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak.	1
207	Center Ave	Wet well	Wet well	3	3	Good	Continue Scheduled Maintenance Activities	7/2011: HRSD PM inspection on 4/11/2011 indicates visible aggregate throughout the wet well and various other degraded components. Roof supports degrading.	2
207	Center Ave	Influent Valve	Influent Valve	5	5	None to Report	Replace/Refurbish	Sluice gate non-operational.	5
207	Center Ave	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	strobe - 892 rpm	1
207	Center Ave	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 890 rpm	1
207	Center Ave	Motor 3	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe = 895 rpm	1
207	Center Ave	Pump 1	Pump	2	2	Good Vibrating	No Immediate Action Required	Slight vibration. Clank sound on startup.	1
207	Center Ave	Pump 2	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Slight vibration. Shaft deflects at the bottom of the motor.	2
207	Center Ave	Pump 3	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Slight vibration. Shaft deflects at the bottom of the motor.	2
207	Center Ave	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
207	Center Ave	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
207	Center Ave	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

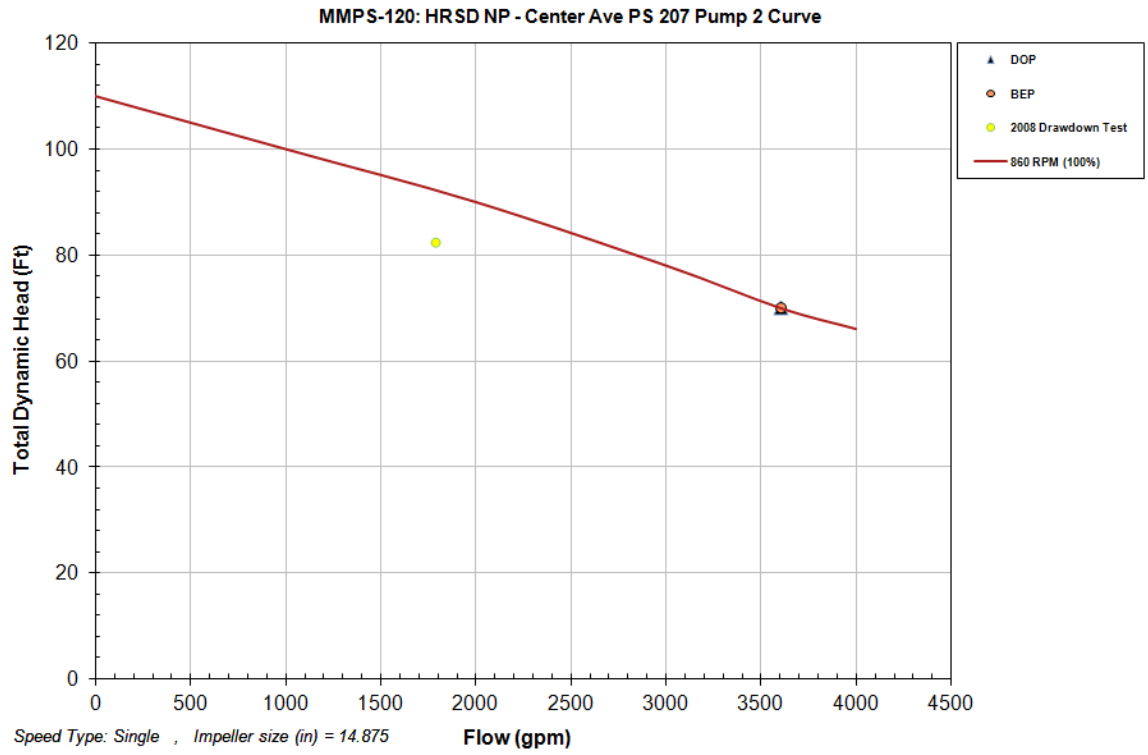
Table 207-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
207	Center Ave	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
207	Center Ave	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete	Continue Scheduled Maintenance Activities	MCC equipment is aging	2
207	Center Ave	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
207	Center Ave	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed	Continue Scheduled Maintenance Activities	No Comment	2
207	Center Ave	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
207	Center Ave	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
207	Center Ave	SCADA	SCADA	2	2	No panel door grounding wire. Terminals not labeled. UPS battery needs to be replaced.	No Immediate Action Required	No Comment	1
207	Center Ave	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No delay in transferring of power from generator back to main.	1
207	Center Ave	Engine	Generator Drive Engine	2	1	Good Leaking Fluids	No Immediate Action Required	Minor leaks.	1
207	Center Ave	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1

Table 207-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
207	Center Ave	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
207	Center Ave	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
207	Center Ave	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





Center Ave PS does not have a dedicated flow meter therefore there is no measured point reported.

### Center Ave Assets of Interest

None.

### Center Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system
  - Antenna tower ground wire is broken

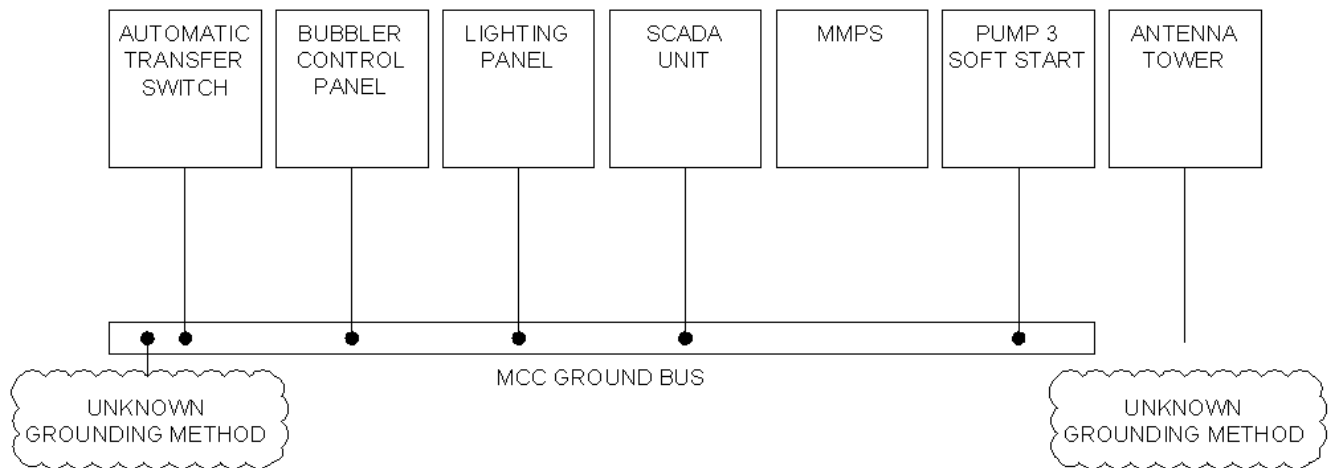


Figure 207-3. Center Ave Grounding System

### Center Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions

- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - MCC equipment is aging

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## PS 208 Claremont Ave Pump Station

### Claremont Ave Facility Description



Figure 208-1. Claremont Ave Pump Station Location Map



Figure 208-2. Claremont Ave Pump Station

<b>Table 208-1. Claremont Ave PS</b>	
Pumping Facility Number	208
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/17/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/16/2011
Date of Construction	1944
Address	1210 Chesapeake Ave, Hampton
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	28 ft.
Firm Pumping Capacity (GPM)	7000 GPM
Total Pumping Capacity (GPM)	10500 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Flygt
Pump Nameplate Capacity	3500 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Flygt
Motor Nameplate Power (HP)	70
Generator Power (KW)	250

*\*Design Head, Firm Pumping Capacity and Total Pumping Capacity read from pump curve at peak efficiency*

### Claremont Ave Results of Evaluation

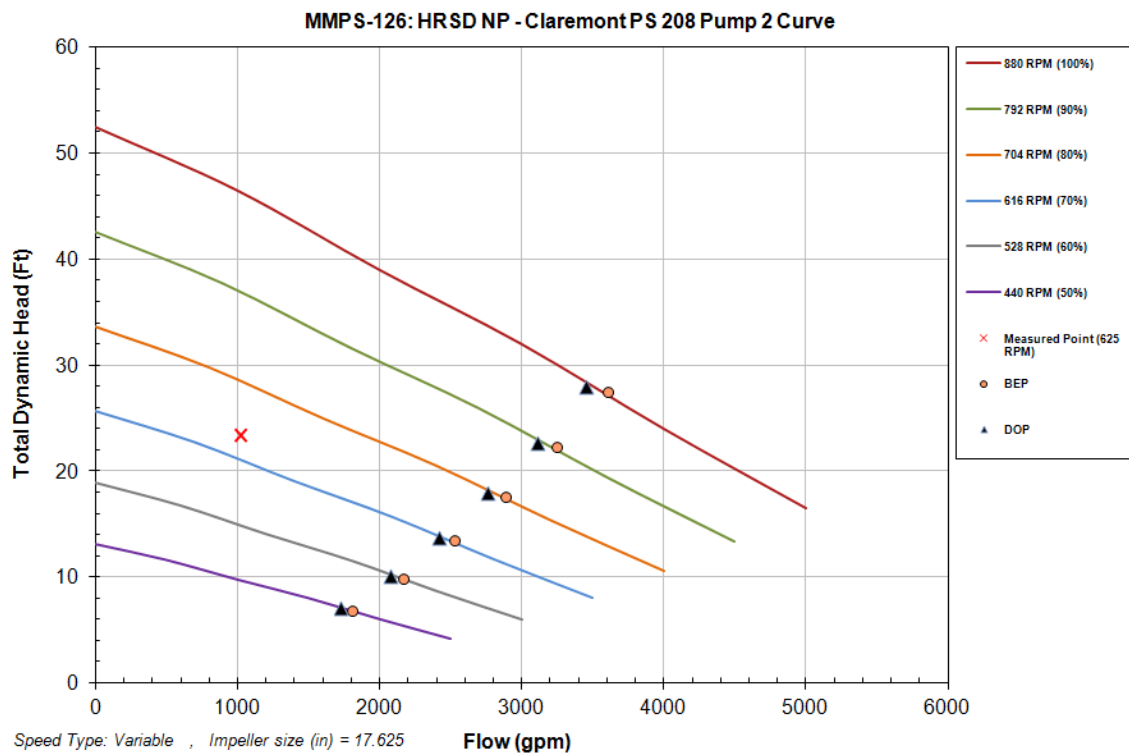
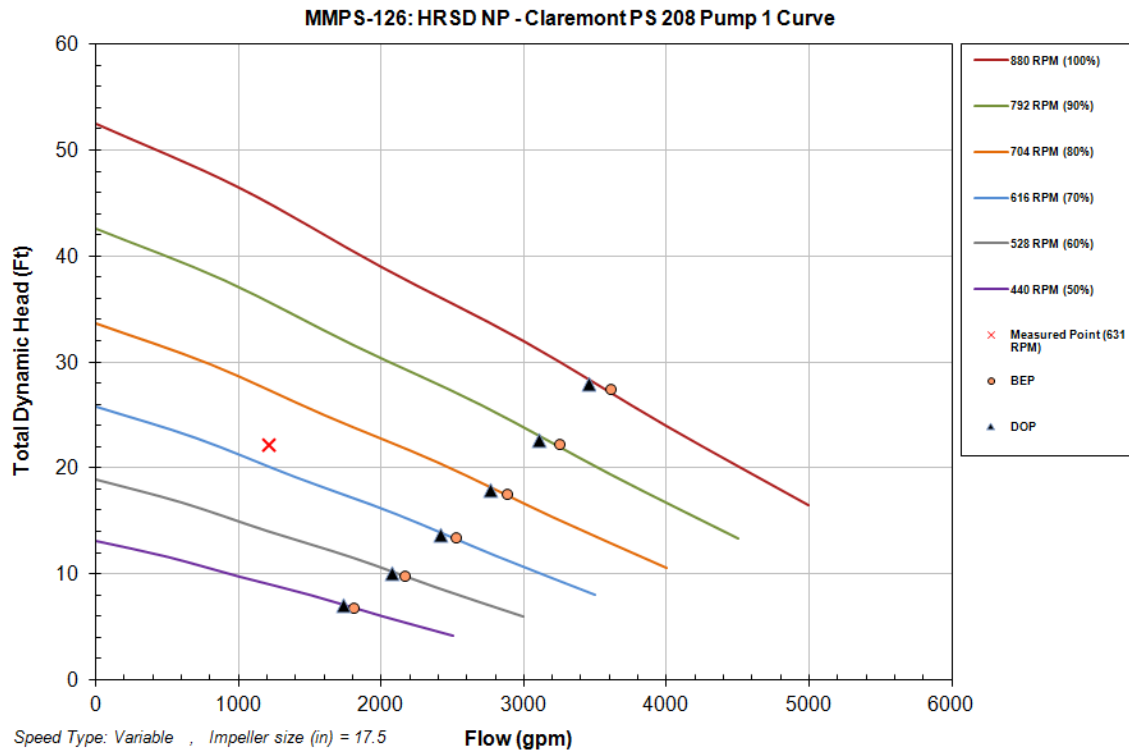
Results from the pumping facility field inspections are summarized in the following table.

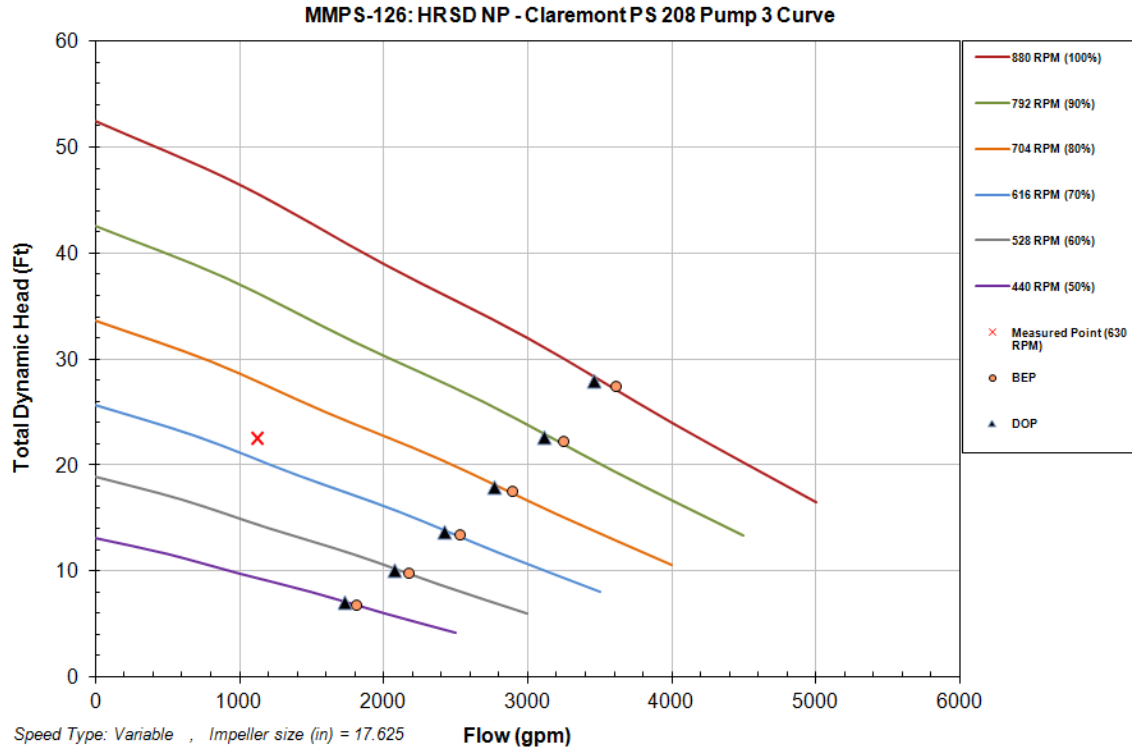
Table 208-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
208	Claremont	Building	Building	2	1	None to Report	No Immediate Action Required	3 - 3 ton cranes. Grinder installation in progress. Hydraulics will be next to dry well vent.	1
208	Claremont	HVAC System	HVAC System	1	1	Good	No Immediate Action Required	Control room fan has minor visible degradation.	1
208	Claremont	Wet well	Wet well	1	1	Good	No Immediate Action Required	Recently rehabilitated. 7/2011: HRSD PM inspection on 12/30/2010 indicates no major changes from the 2008 wet well data.	1
208	Claremont	Motor 1	Electrical Pump Motor and Controller	1	2	Good	No Immediate Action Required	Pump was ragged upon arrival so that no flow could be observed until crew deragged pump.	1
208	Claremont	Motor 2	Electrical Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
208	Claremont	Motor 3	Electrical Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
208	Claremont	Pump 1	Pump	1	2	Good	No Immediate Action Required	Pump ragged up enough to prevent fluid from pumping. Pump operated fine after deragging.	1
208	Claremont	Pump 2	Pump	1	1	Good	No Immediate Action Required	Lead pump operating at 35 Hz (900 gpm, 0.6 fps) upon arrival.	1
208	Claremont	Pump 3	Pump	1	1	Good	No Immediate Action Required	Flow meter recorded 4200 gpm, 2.7 fps. Relatively noisy compared to other pumps.	1
208	Claremont	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
208	Claremont	Valves System	All Station Valves	1	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
208	Claremont	Suction Isolation Valve Pump 1	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Suction Isolation Valve Pump 2	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Suction Isolation Valve Pump 3	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Check Valve Pump 1	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Check Valve Pump 2	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 208-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
208	Claremont	Check Valve Pump 3	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
208	Claremont	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	Proper pump wiring hangers not utilized.	1
208	Claremont	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	No Comment	1
208	Claremont	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
208	Claremont	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
208	Claremont	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
208	Claremont	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
208	Claremont	SCADA	SCADA	1	1	Located in the buubler control panel	No Immediate Action Required	No Comment	1
208	Claremont	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No Comment	1
208	Claremont	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
208	Claremont	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
208	Claremont	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1
208	Claremont	Tank 1	Fuel Day Tank	3	1	Good Leaking	Continue Scheduled Maintenance Activities	Fuel line elbow near the wall is leaking.	2
208	Claremont	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

## Draw-Down Testing





Claremont PS pumps were replaced since the 2008 draw down tests. 2008 point is not shown.

### Claremont Ave Assets of Interest

None.

### Claremont Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system

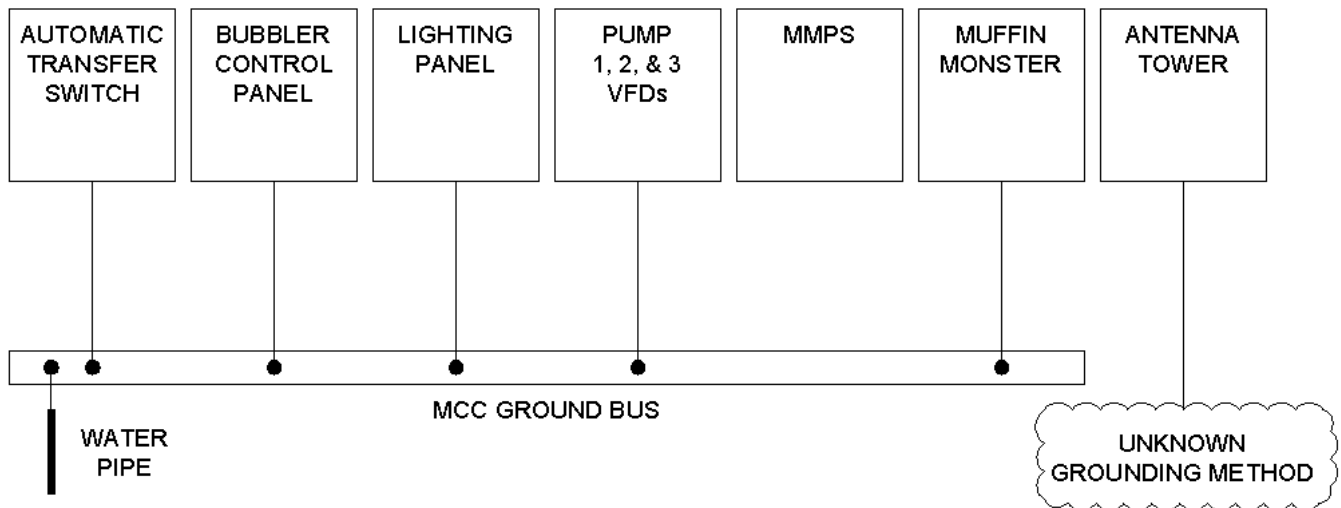


Figure 208-3. Claremont Ave Grounding System

### Claremont Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate

- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Proper pump wiring hangers not utilized

### **Claremont Ave Dual Power Feed/Lightning Strike Power Failures**

No history of failure.



## PS 209 Copeland Park Pump Station

### Copeland Park Facility Description

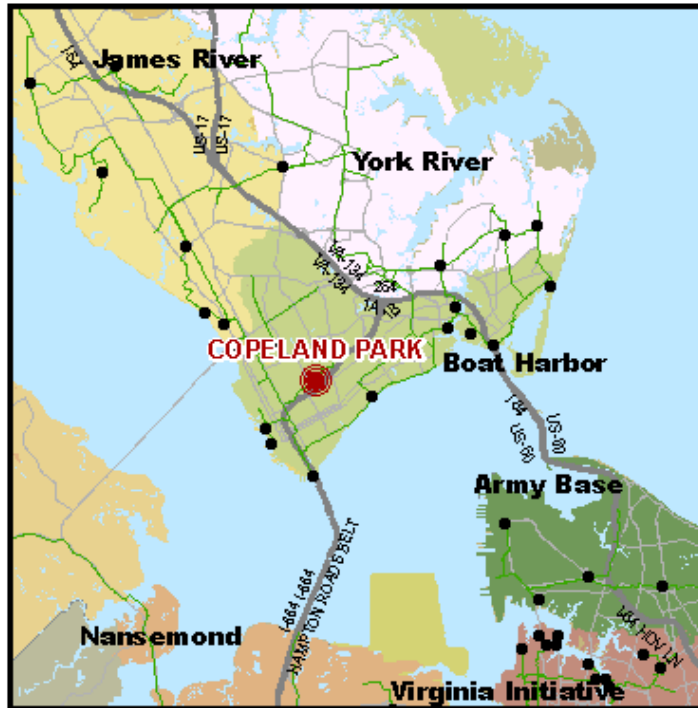


Figure 209-1. Copeland Park Pump Station Location Map



Figure 209-2. Copeland Park Pump Station

<b>Table 209-1. Copeland Park PS</b>	
<b>Pumping Facility Number</b>	<b>209</b>
<b>Date of Initial Inspection</b>	<b>6/26/2008</b>
<b>Date of Update Inspection</b>	<b>6/17/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>8/15/2011</b>
<b>Date of Construction</b>	<b>1977</b>
<b>Address</b>	<b>4401 City Line Rd, Newport News</b>
<b>Receiving Facility</b>	<b>Boat Harbor Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>45 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>5400 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>8100 GPM</b>
<b>Number of Pumps</b>	<b>3</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Aurora</b>
<b>Pump Nameplate Capacity</b>	<b>2700 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>U.S. Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>50</b>
<b>Generator Power (KW)</b>	<b>125</b>

### **Copeland Park Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Copeland Park pump station was in the process of building renovations during the facility inspections.

**Table 209-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
209	Copeland Park	Building	Building	3	1	None to Report	Continue Scheduled Maintenance Activities	Seepage through wall pipe penetration. Renovations in progress. Portions of the exterior walls are knocked out. Materials for rebuild are on site. 1.5 ton crane.	2
209	Copeland Park	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	2 fans are in rooms with renovations in progress - operation not tested. Louvers have been recently updated to PVC.	1
209	Copeland Park	Wet well	Wet well	3	3	Concrete Spalling	Continue Scheduled Maintenance Activities	7/2011: HRSD PM inspection on 4/29/2011 indicates no major changes from the 2008 wet well data. There is visible aggregate around the influent pipe.	2
209	Copeland Park	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Motor 3	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Pump 1	Pump	3	3	Good Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	No nameplate on pumps. Visible shaft deflection in operation. Upper shaft bearing throwing rust colored dust. Pump vibrating likely from shaft. Pump has aftermarket water dam on stuffing box.	2

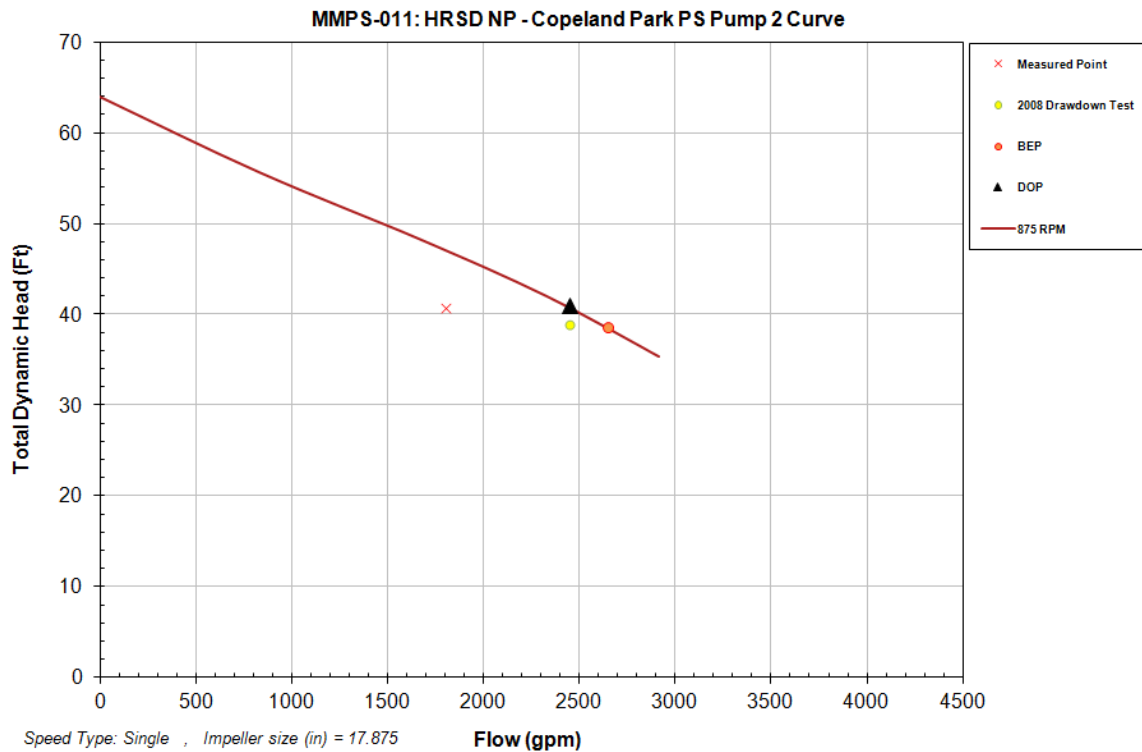
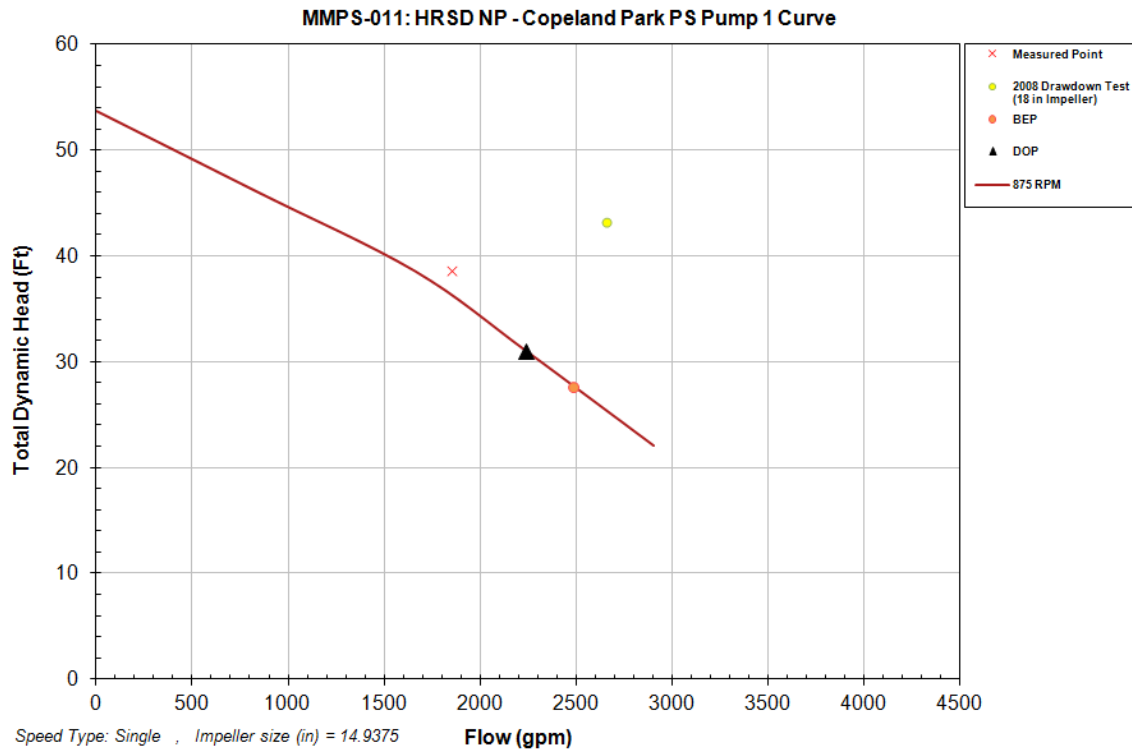
**Table 209-2. Pumping Facility Asset Condition and Performance Ratings**

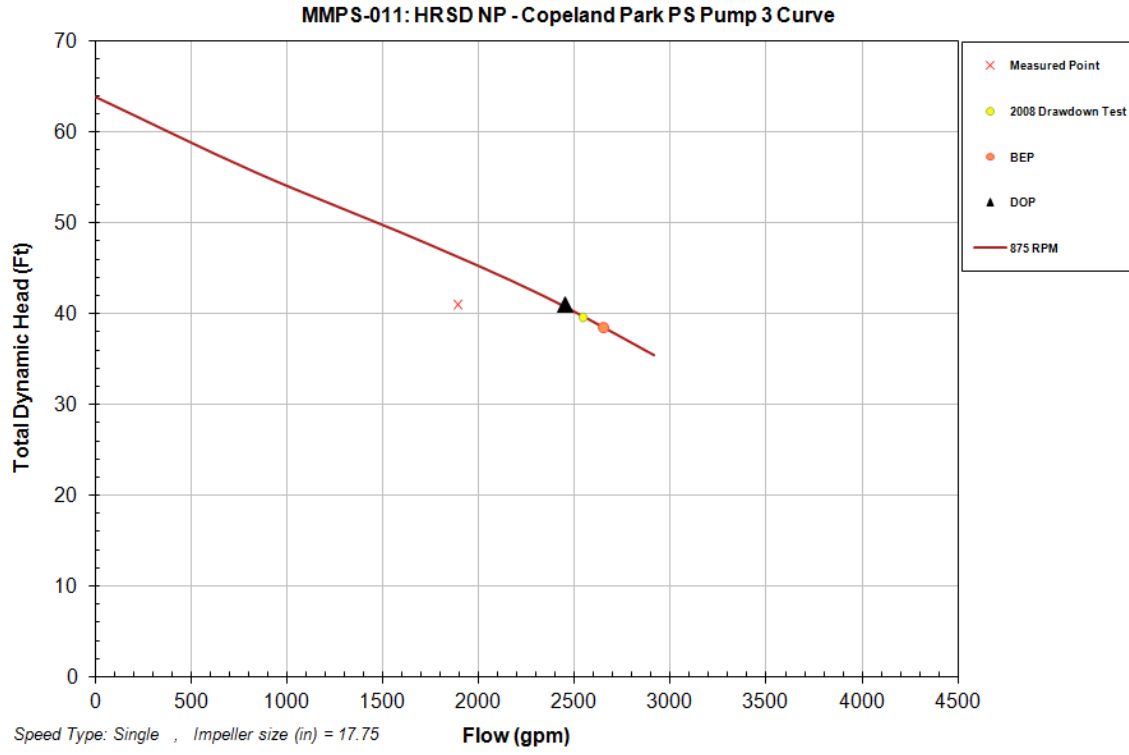
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
209	Copeland Park	Pump 2	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	No nameplate on the pumps. Shaft deflection minor but loud and causing pump minor vibration. Pump has aftermarket water dam on stuffing box.	1
209	Copeland Park	Pump 3	Pump	3	1	Good	Continue Scheduled Maintenance Activities	No nameplate on the pump. Pump support rusting. Stuffing box slings a lot of water. The shaft makes a squeaking noise. Pump has aftermarket water dam on stuffing box.	2
209	Copeland Park	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valve #3 leaks and the lever appears to be out of alignment. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
209	Copeland Park	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Check Valve Pump 3	Check Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
209	Copeland Park	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
209	Copeland Park	Electrical Equipment	Electrical Equipment	3	2	Good Panel Obsolete	Continue Scheduled Maintenance Activities	MCC equipment is aging. Consider upgrading MCC. Ground bus has some corrosion	2

**Table 209-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
209	Copeland Park	Instrumentation System	Instrumentation System	2	2	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed. Panel is aging.	Continue Scheduled Maintenance Activities	Consider upgrading panel.	2
209	Copeland Park	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
209	Copeland Park	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
209	Copeland Park	SCADA	SCADA	3	2	No panel door grounding wire. Terminals not labeled. Panel ground wire is corroded.	Continue Scheduled Maintenance Activities	No Comment	2
209	Copeland Park	Transfer Switch	Transfer Switch	3	2	Equipment is aging. Ground bus has corrosion forming	Continue Scheduled Maintenance Activities	Consider upgrading transfer switch	2
209	Copeland Park	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
209	Copeland Park	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Copeland Park Assets of Interest

None.

### Copeland Park Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - Bubbler control panel & MMPS is not bonded to the station grounding system

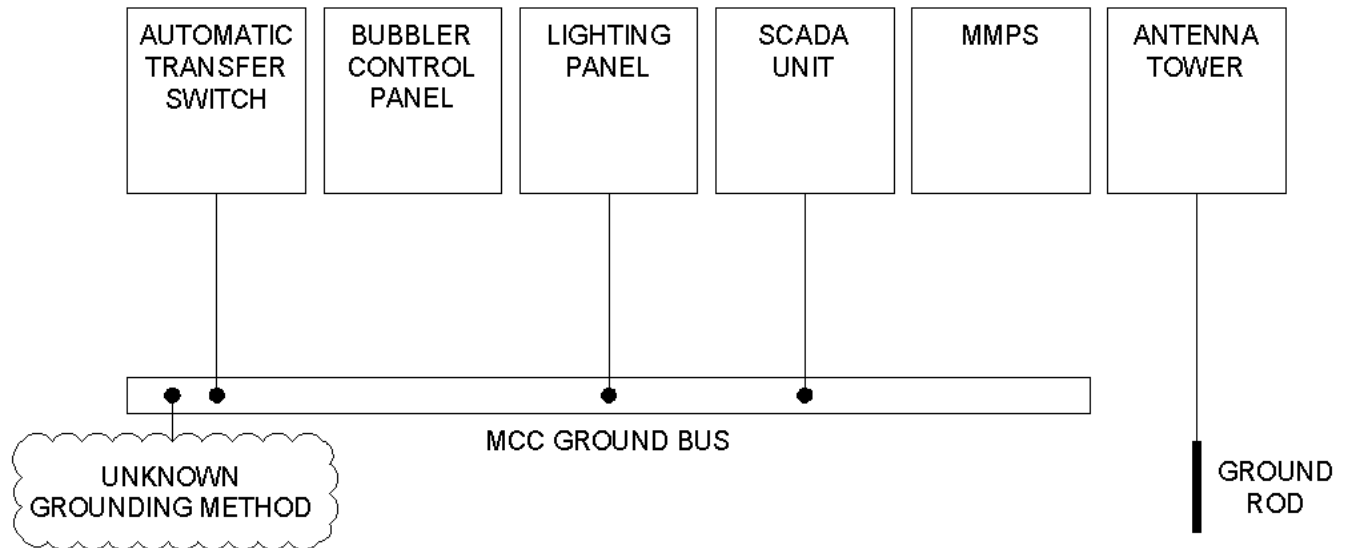


Figure 209-3. Copeland Park Grounding System

### Copeland Park Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged



- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - MCC equipment is aging
  - Disconnect panel very corroded

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## PS 210 Ferguson Park Pump Station

### Ferguson Park Facility Description



Figure 210-1. Ferguson Park Pump Station Location Map



Figure 210-2. Ferguson Park Pump Station

<b>Table 210-1. Ferguson Park PS</b>	
<b>Pumping Facility Number</b>	<b>210</b>
<b>Date of Initial Inspection</b>	<b>6/30/2008</b>
<b>Date of Update Inspection</b>	<b>6/16/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>8/4/2011</b>
<b>Date of Construction</b>	<b>1968</b>
<b>Address</b>	<b>227 75th Street, Newport News</b>
<b>Receiving Facility</b>	<b>Boat Harbor Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>65 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>450 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>900 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>450 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Motor Nameplate Power (HP)</b>	<b>15</b>
<b>Generator Power (KW)</b>	<b>50</b>

### **Ferguson Park Results of Evaluation**

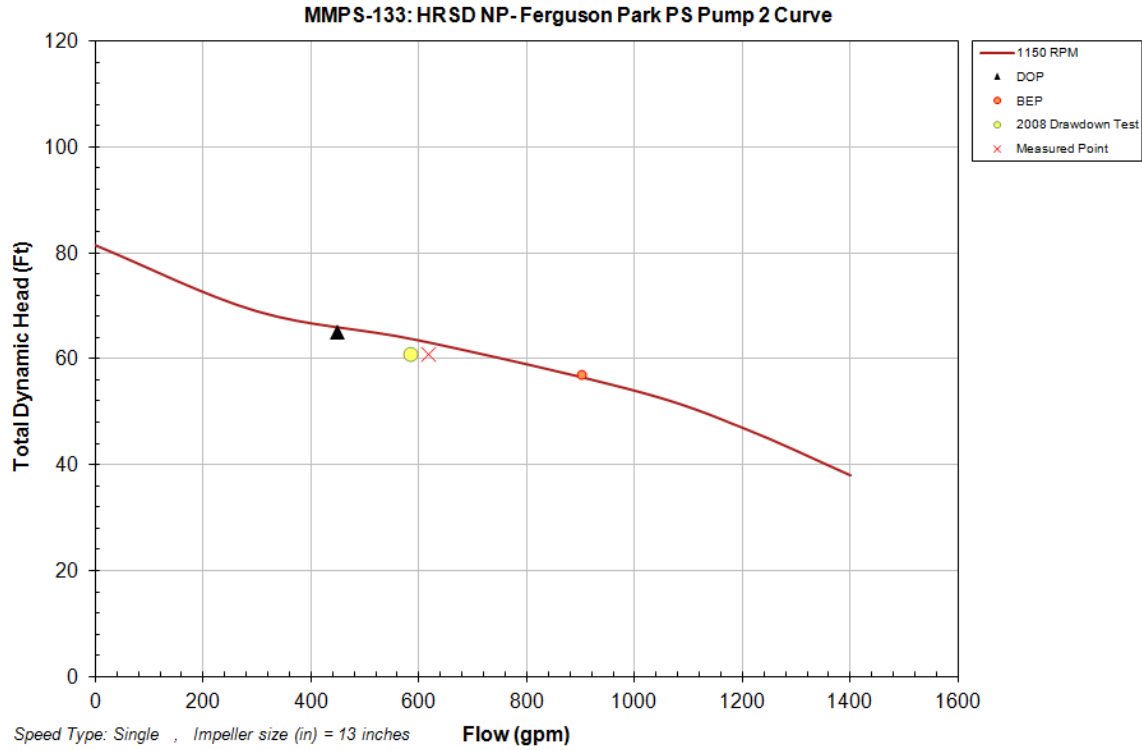
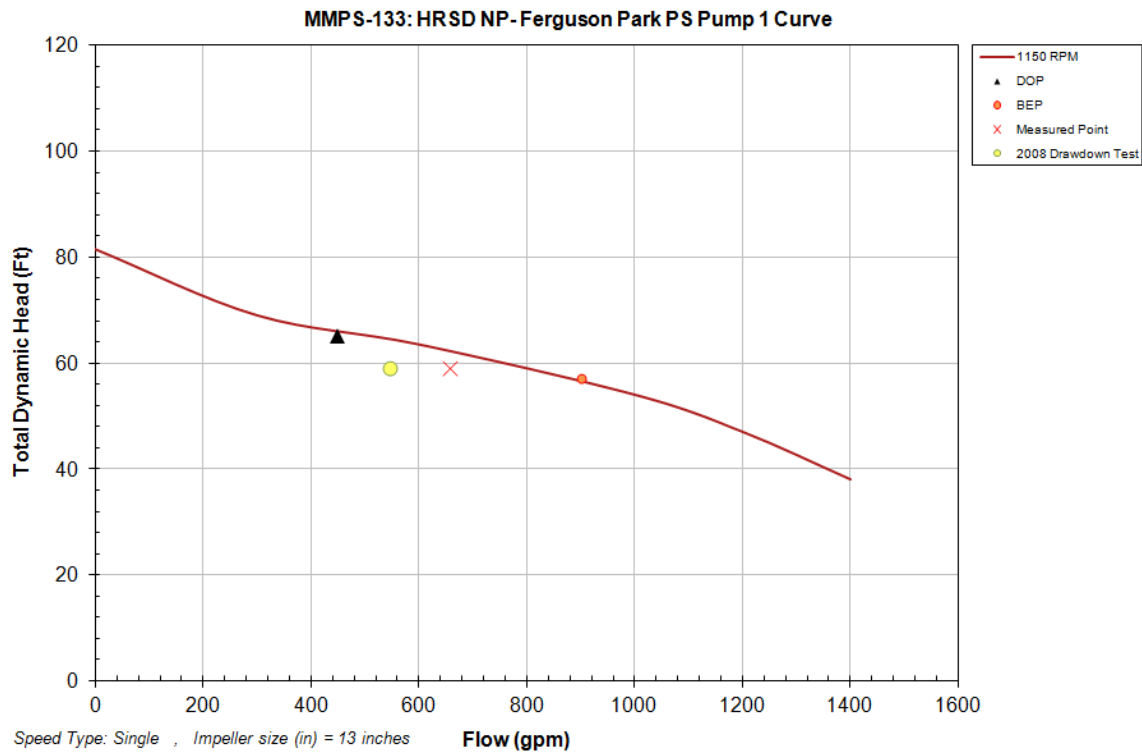
Results from the pumping facility field inspections are summarized in the following table.

Table 210-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
210	Ferguson Park	Building	Building	2	1	Good	No Immediate Action Required	New roof.	1
210	Ferguson Park	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation weak.	1
210	Ferguson Park	Wet well	Wet well	2	2	Good	No Immediate Action Required	Set point of wet well cannot be raised because it will surcharge a lateral in the upstream manhole. 7/2011: HRSD PM inspection on 8/25/2010 indicates no major changes from the 2008 wet well data. There is visible aggregate at the waterline.	1
210	Ferguson Park	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
210	Ferguson Park	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Nameplate illegible. Strobe - 1181rpm	1
210	Ferguson Park	Motor 2	Electrical Pump Motor and Controller	2	1	Good Makes Noise	No Immediate Action Required	Nameplate illegible. Strobe - 1172rpm. Motor makes a faint squeak.	1
210	Ferguson Park	Pump 1	Pump	2	2	Good	No Immediate Action Required	Painted nameplate. Clanking noise on startup. Site frequently has low flow conditions.	1
210	Ferguson Park	Pump 2	Pump	2	1	Good	No Immediate Action Required	Painted nameplate. Site frequently has low flow conditions.	1
210	Ferguson Park	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
210	Ferguson Park	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
210	Ferguson Park	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
210	Ferguson Park	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
210	Ferguson Park	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
210	Ferguson Park	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
210	Ferguson Park	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 210-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
210	Ferguson Park	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
210	Ferguson Park	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No panel door ground wire installed on starters.	1
210	Ferguson Park	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
210	Ferguson Park	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed. Panel is getting old.	No Immediate Action Required	Consider upgrading panel.	1
210	Ferguson Park	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
210	Ferguson Park	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
210	Ferguson Park	SCADA	SCADA	2	2	No panel door grounding wire.	No Immediate Action Required	Terminals not labeled.	1
210	Ferguson Park	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No Comment	1
210	Ferguson Park	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
210	Ferguson Park	Generator	Generator	1	1	Good	No Immediate Action Required	New	1
210	Ferguson Park	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1
210	Ferguson Park	Tank 1	Fuel Tank	1	1	Good	No Immediate Action Required	Belly tank. No day tank	1

### Draw-Down Testing



### Ferguson Park Assets of Interest

None.

### Ferguson Park Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - Bubbler control panel & MMPS is not bonded to the station grounding system

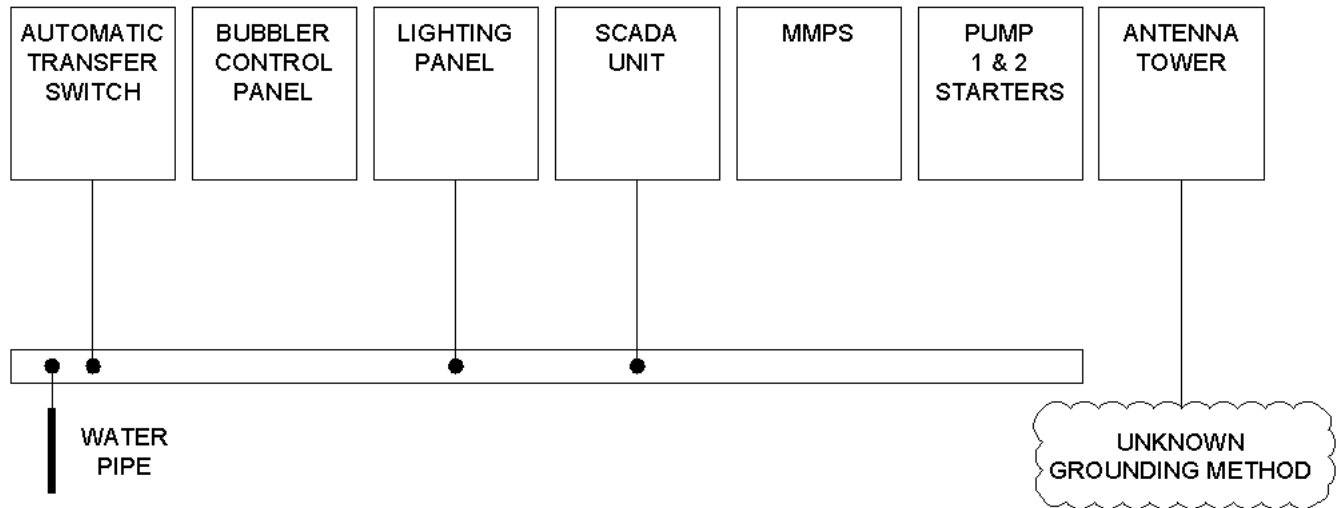


Figure 210-3. Ferguson Park Grounding System

### Ferguson Park Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions



- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 211 Hampton Institute Pump Station

### Hampton Institute Facility Description



Figure 211-1. Hampton Institute Pump Station Location Map



Figure 211-2. Hampton Institute Pump Station

<b>Table 211-1. Hampton Institute PS</b>	
Pumping Facility Number	211
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/17/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1945
Address	54 Shore Drive, Hampton
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	20 ft.
Firm Pumping Capacity (GPM)	800 GPM
Total Pumping Capacity (GPM)	2050 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	800 GPM, 1250 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric
Motor Nameplate Power (HP)	10
Generator Power (KW)	None

### Hampton Institute Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

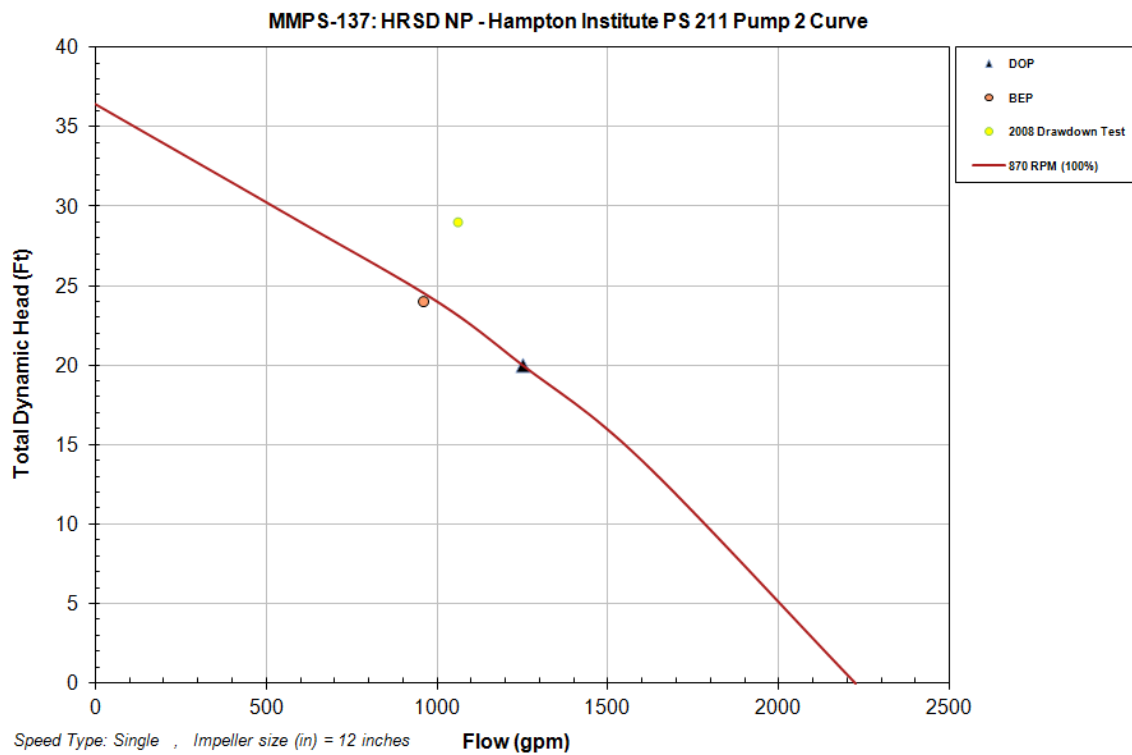
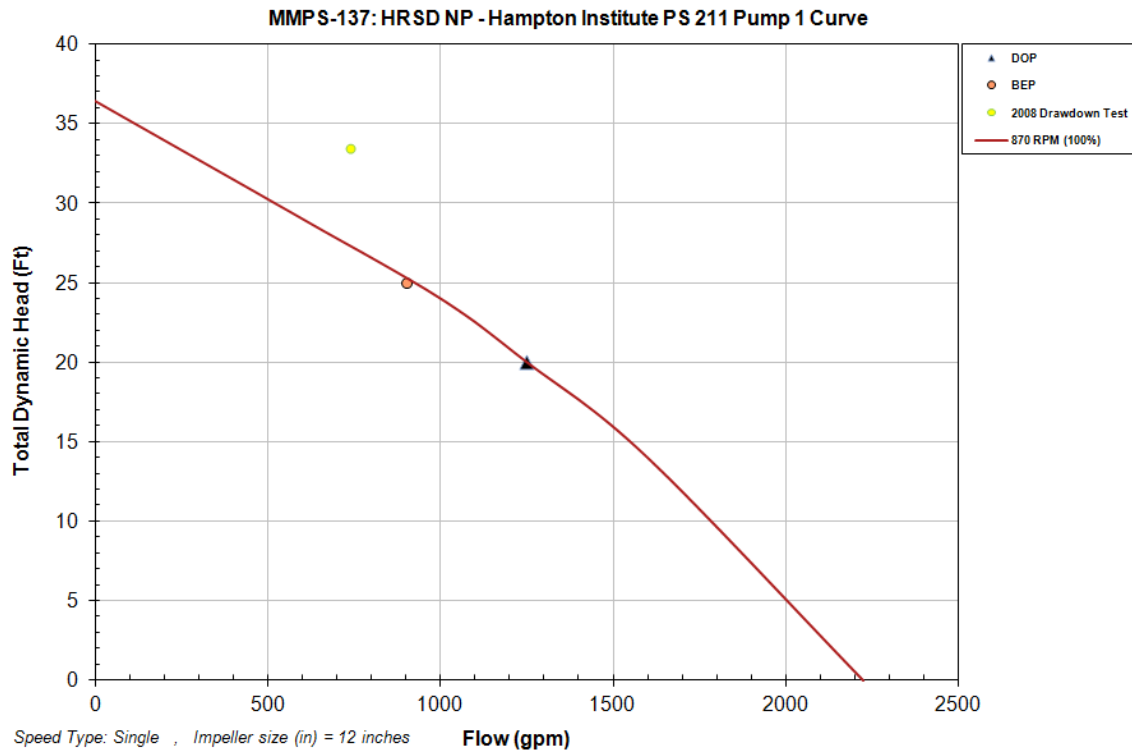
Table 211-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
211	Hampton Institute	Building	Building	2	1	Good	No Immediate Action Required	Asbestos ceiling	1
211	Hampton Institute	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation weak. Wet well fan pulling away from building.	1
211	Hampton Institute	Wet well	Wet well	2	1	Good	No Immediate Action Required	Wet well was rehabilitated in 2006. 7/2011: HRSD PM inspection on 5/26/2011 indicates no major changes from the 2008 wet well data. The report states that a steel lintel over a door supporting brick wall is in very bad condition.	1
211	Hampton Institute	Influent Valve	Influent Valve	1	1	None to Report	No Immediate Action Required	No Comment	1
211	Hampton Institute	Motor 1	Electrical Pump Motor and Controller	2	2	Good Makes Noise	No Immediate Action Required	Noise coming from top end	1
211	Hampton Institute	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
211	Hampton Institute	Pump 1	Pump	2	3	Good	Continue Scheduled Maintenance Activities	Nameplate illegible. Lag pump on day of visit - not primed upon site arrival. Pump made noises.	2
211	Hampton Institute	Pump 2	Pump	2	1	Good Shaft Deflection	No Immediate Action Required	Nameplate illegible. Slight visible shaft deflection.	1
211	Hampton Institute	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
211	Hampton Institute	Valves System	All Station Valves	2	2	Good	No Immediate Action Required	7/11: HRSD inspections indicate #2 discharge takes 4 people to operate, however, HRSD is still able to perform proper maintenance on the pump.	1
211	Hampton Institute	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
211	Hampton Institute	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
211	Hampton Institute	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
211	Hampton Institute	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 211-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
211	Hampton Institute	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
211	Hampton Institute	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	4	See Valves System Field Observations	Corrective Action Required	See Valves System Comments	4
211	Hampton Institute	Electrical Equipment	Electrical Equipment	2	2	Good Panel Corroded Cables Fatigued and Cracked	No Immediate Action Required	Alternate power feed instead of standby generator. Other electrical systems good.	1
211	Hampton Institute	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
211	Hampton Institute	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
211	Hampton Institute	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
211	Hampton Institute	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
211	Hampton Institute	SCADA	SCADA	2	2	No panel door grounding wire. Terminals not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	Label terminals. Cap loose wires. .	1
211	Hampton Institute	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	Install panel door ground wire	1

### Draw-Down Testing



There is no measured point reported because the flow meter was removed from Hampton Institute PS.

### Hampton Institute Assets of Interest

None.

### Hampton Institute Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - Bubbler control panel & MMPS is not bonded to the station grounding system

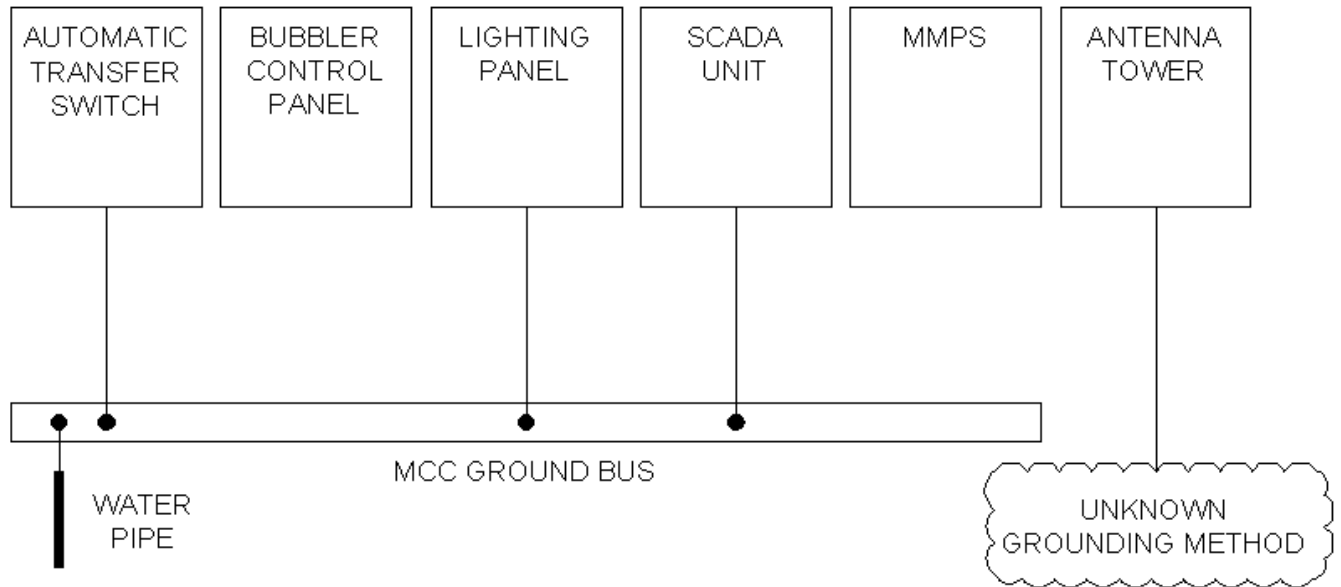


Figure 211-3. Hampton University Grounding System

### Hampton Institute Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment



- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator

### Hampton Institute Dual Power Feed Assessment

Information obtained about the electrical services feeding this pump station indicates that the station has complete redundant electrical services feeding it. The station has two utility meters fed from separate power lines provided by the local utility. This station has complete redundancy but power losses are still possible.

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## PS 212 Hilton School Pump Station

### Hilton School Facility Description

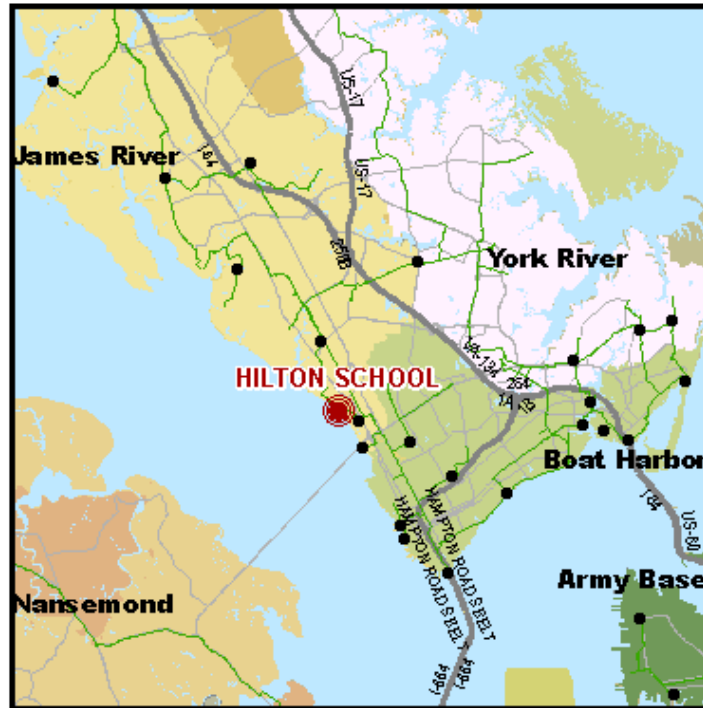


Figure 212-1. Hilton School Pump Station Location Map



Figure 212-2. Hilton School Pump Station

<b>Table 212-1. Hilton School PS</b>	
Pumping Facility Number	212
Date of Initial Inspection	6/30/2008
Date of Update Inspection	6/16/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/1/2011
Date of Construction	1948
Address	223 River Rd, Newport News
Receiving Facility	James River Treatment Plant
Design Head (Feet)	23 ft.
Firm Pumping Capacity (GPM)	350 GPM
Total Pumping Capacity (GPM)	700 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	350 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	5
Generator Power (KW)	25

### Hilton School Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

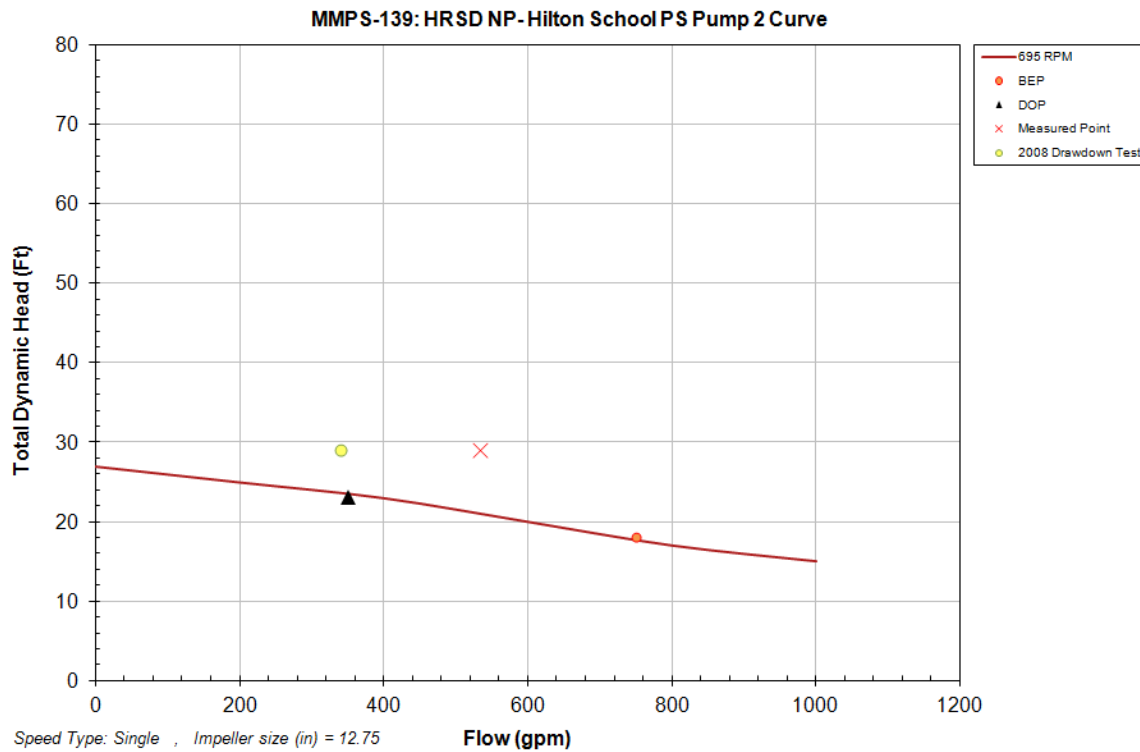
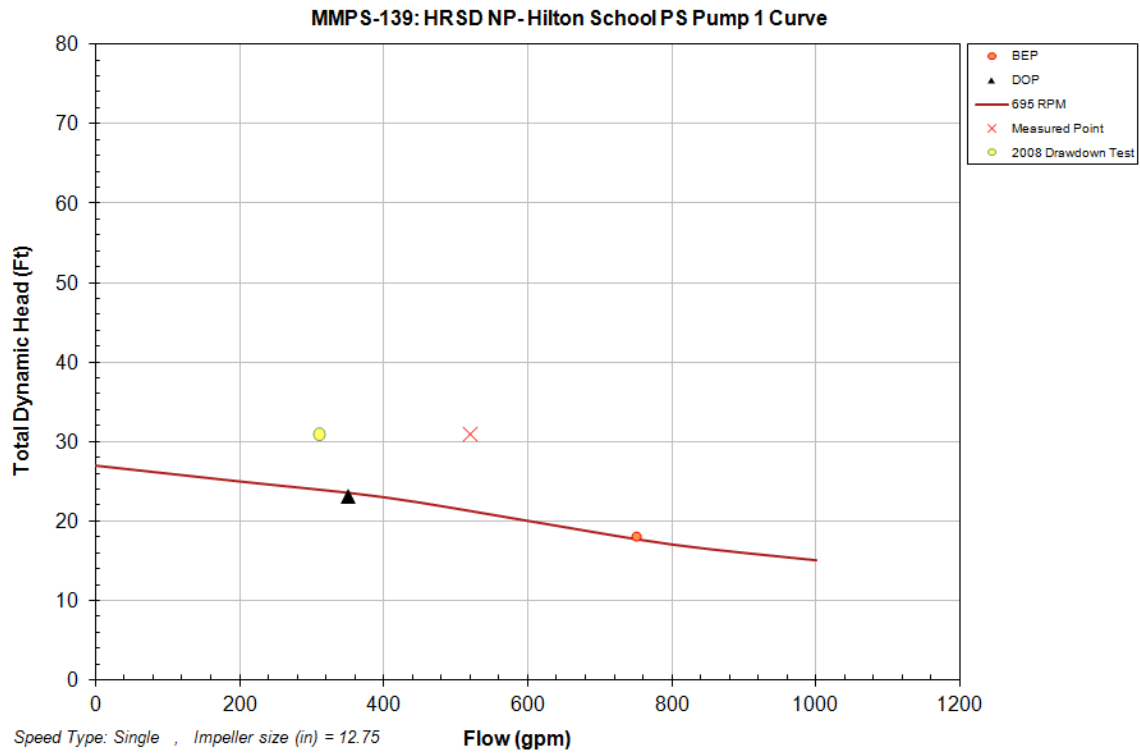
Table 212-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
212	Hilton School	Building	Building	2	1	Good	No Immediate Action Required	The building is becoming obsolete because new equipment installations have significantly reduced the room to move throughout the station. The roof has some discoloration.	1
212	Hilton School	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak.	1
212	Hilton School	Wet well	Wet well	3	2	Concrete Spalling	Continue Scheduled Maintenance Activities	Visible Spalling 7/2011: HRSD PM inspection on 1/21/2011 indicates no major changes from the 2008 wet well data. Roof trusses are beginning to rust.	2
212	Hilton School	Influent Valve	Influent Valve	3	2	None to Report	Continue Scheduled Maintenance Activities	Corrosion. Minor leakage.	2
212	Hilton School	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 710rpm	1
212	Hilton School	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 712rpm	1
212	Hilton School	Pump 1	Pump	2	1	Good	No Immediate Action Required	No Comment	1
212	Hilton School	Pump 2	Pump	3	2	None to Report	Continue Scheduled Maintenance Activities	Squeaking noise from drive train or top end of pump. Stuffing box is dry.	2
212	Hilton School	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
212	Hilton School	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
212	Hilton School	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
212	Hilton School	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
212	Hilton School	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
212	Hilton School	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
212	Hilton School	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 212-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
212	Hilton School	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
212	Hilton School	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
212	Hilton School	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
212	Hilton School	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
212	Hilton School	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
212	Hilton School	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
212	Hilton School	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled. MCC interferes with door opening.	No Immediate Action Required	No Comment	1
212	Hilton School	Transfer Switch	Transfer Switch	1	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No panel door grounding wire.	1
212	Hilton School	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
212	Hilton School	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
212	Hilton School	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
212	Hilton School	Tank 1	Fuel Tank	1	1	Good	No Immediate Action Required	Belly Tank	1

### Draw-Down Testing



### Hilton School Assets of Interest

None.

### Hilton School Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - Velocity Profiler has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - Velocity Profiler & MMPS are not bonded to the station grounding system

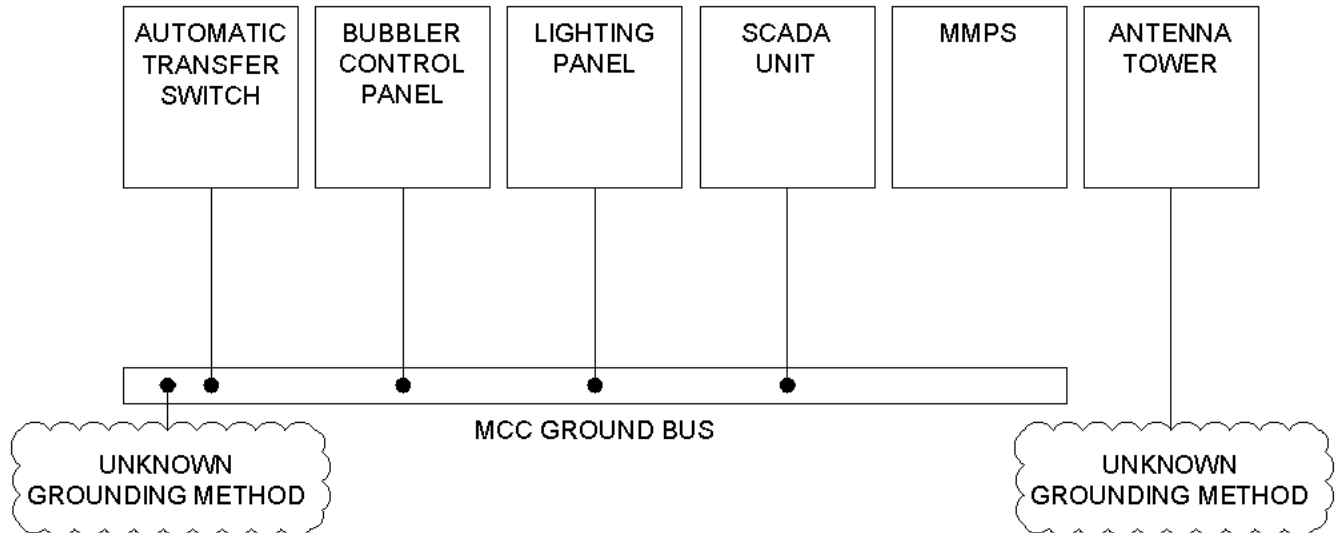


Figure 212-3. Hilton School Grounding System

### Hilton School Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged



- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 213 Jefferson Ave Pump Station

### Jefferson Ave Facility Description

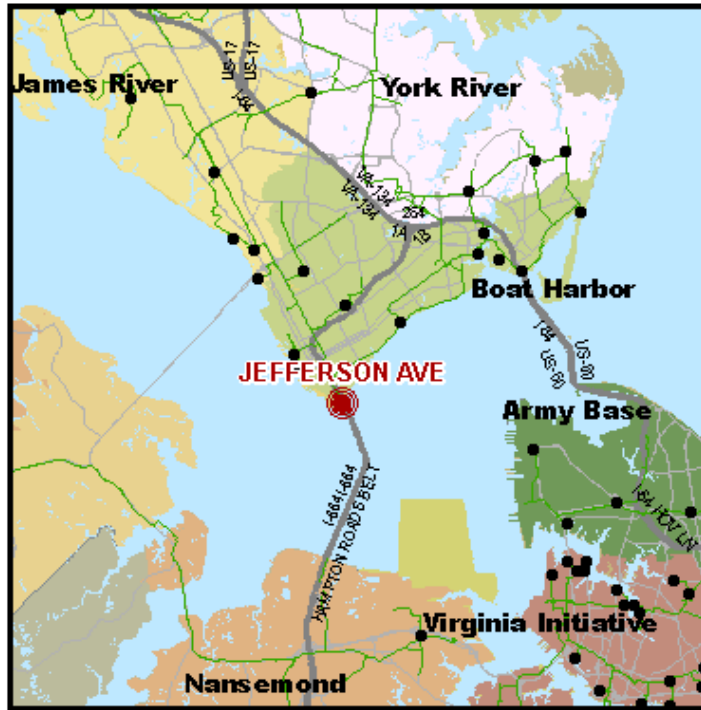


Figure 213-1. Jefferson Ave Pump Station Location Map



Figure 213-2. Jefferson Ave Pump Station

<b>Table 213-1. Jefferson Ave PS</b>	
Pumping Facility Number	213
Date of Initial Inspection	6/27/2008
Date of Update Inspection	6/16/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/16/2011
Date of Construction	1944
Address	BHTP, Newport News
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	25 ft.
Firm Pumping Capacity (GPM)	1780 GPM
Total Pumping Capacity (GPM)	3855 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Worthington, Fairbanks Morse
Pump Nameplate Capacity	1780 GPM, 2075 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	U.S. Electric, Fairbanks Morse
Motor Nameplate Power (HP)	15, 25
Generator Power (KW)	None

### Jefferson Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

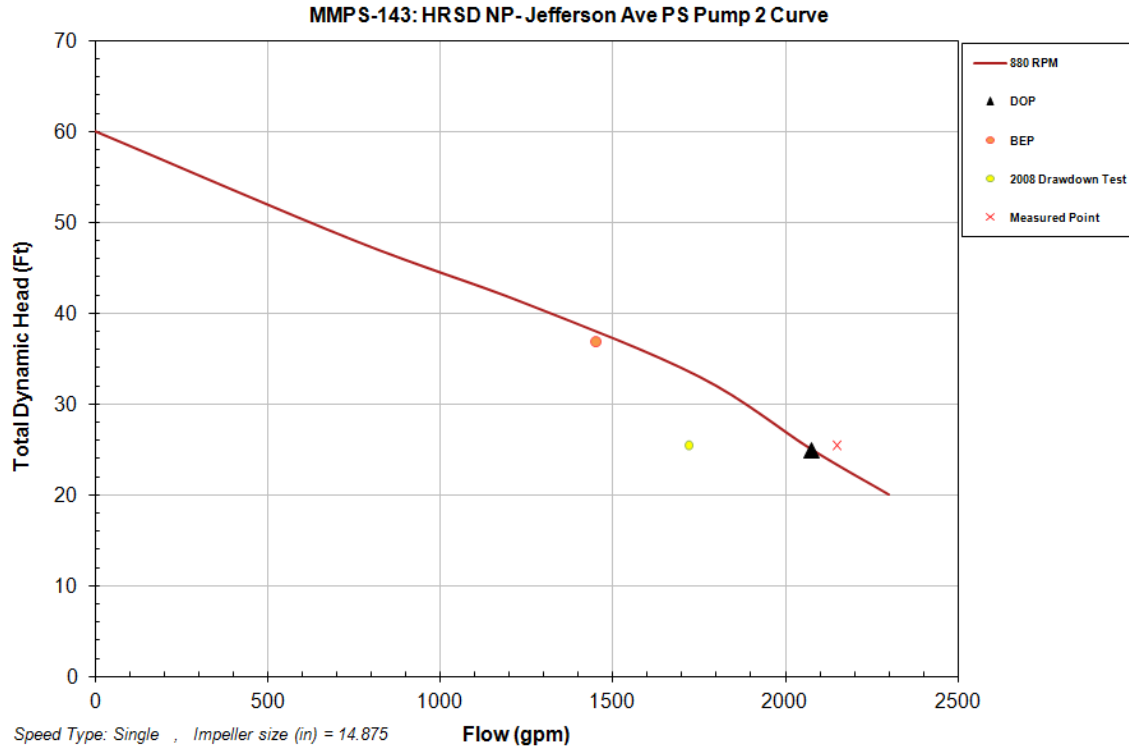
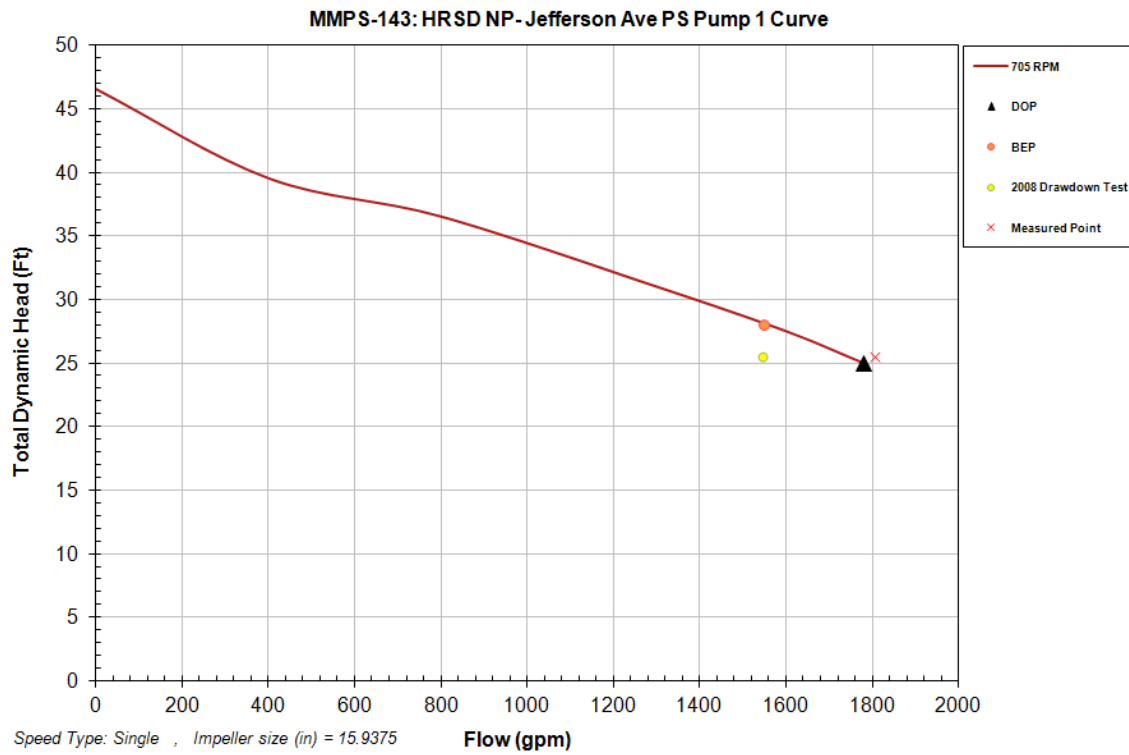
**Table 213-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
213	Jefferson Ave	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
213	Jefferson Ave	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak.	1
213	Jefferson Ave	Wet well	Wet well	2	1	Good	No Immediate Action Required	7/2011: HRSD PM inspection on 10/6/2010 indicates no major changes from the 2008 wet well data. Concrete assessed as fair condition. No depth of corrosion reported.	1
213	Jefferson Ave	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
213	Jefferson Ave	Motor 1	Electrical Pump Motor and Controller	2	2	Good Vibrates	No Immediate Action Required	Vibration slight likely from shaft - Not enough to affect overall rating	1
213	Jefferson Ave	Motor 2	Electrical Pump Motor and Controller	2	1	Good Opposite End Bearing Noise	No Immediate Action Required	Faint scratching related to rotation at the top end.	1
213	Jefferson Ave	Pump 1	Pump	2	2	Good Vibrating Shaft Deflection	No Immediate Action Required	No nameplate. Vibration likely from shaft.	1
213	Jefferson Ave	Pump 2	Pump	2	1	Good	No Immediate Action Required	No nameplate.	1
213	Jefferson Ave	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
213	Jefferson Ave	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
213	Jefferson Ave	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
213	Jefferson Ave	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
213	Jefferson Ave	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
213	Jefferson Ave	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
213	Jefferson Ave	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
213	Jefferson Ave	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

**Table 213-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
213	Jefferson Ave	Electrical Equipment	Electrical Equipment	2	1	Good Dust Inside Panel	No Immediate Action Required	Alternate power feed instead of standby generator. Other electrical systems good. MCC/Starters - Lugs and buses are showing signs of corrosion	1
213	Jefferson Ave	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
213	Jefferson Ave	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
213	Jefferson Ave	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
213	Jefferson Ave	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
213	Jefferson Ave	SCADA	SCADA	2	1	No panel door grounding wire is installed. Uncapped wires loose in the panel. Terminal strip not labeled.	No Immediate Action Required	No Comment	1

## Draw-Down Testing



### Jefferson Ave Assets of Interest

None.

### Jefferson Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system

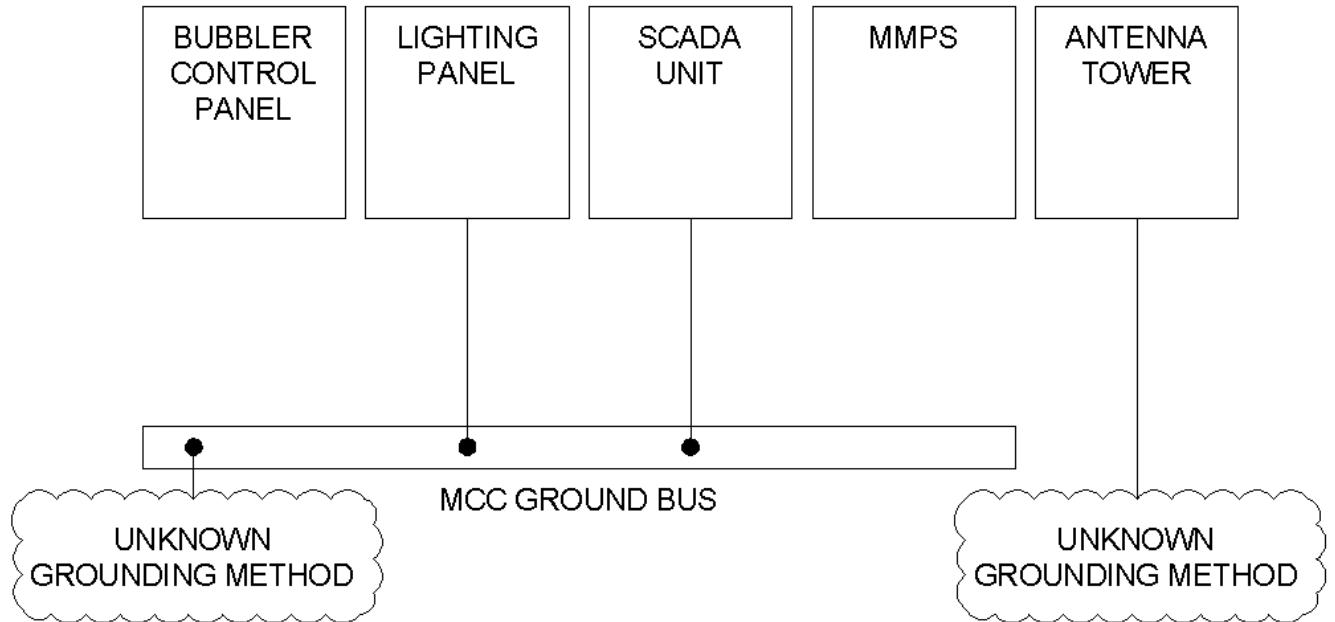


Figure 213-3. Jefferson Ave Grounding System

### Jefferson Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn



- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator.

### Jefferson Ave Dual Power Feed Assessment

Information obtained from the local electrical utility indicates that this station has no redundancy from the utility. This utilizes the emergency generator from Boat Harbor Treatment Plant to supply redundant power. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.

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## PS 214 Kingsmill Pump Station

### Kingsmill Facility Description



Figure 214-1. Kingsmill Pump Station Location Map



Figure 214-2. Kingsmill Pump Station

<b>Table 214-1. Kingsmill PS</b>	
<b>Pumping Facility Number</b>	<b>214</b>
<b>Date of Initial Inspection</b>	<b>7/1/2008</b>
<b>Date of Update Inspection</b>	<b>6/15/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>8/2/2011</b>
<b>Date of Construction</b>	<b>1971</b>
<b>Address</b>	<b>7851 Pocahontas Trl, Williamsburg</b>
<b>Receiving Facility</b>	<b>Williamsburg Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>45 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>6000 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>11100 GPM</b>
<b>Number of Pumps</b>	<b>3</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Alliss Chalmers</b>
<b>Pump Nameplate Capacity</b>	<b>3000 GPM, 3000 GPM, 5100 PM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>WEG</b>
<b>Motor Nameplate Power (HP)</b>	<b>100</b>
<b>Generator Power (KW)</b>	<b>400</b>

### **Kingsmill Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.

Table 214-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
214	Kingsmill	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
214	Kingsmill	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Could not verify wet well fan performance. Fan was functioning. The dry well weak feeling ventilation. There is a scrubber onsite.	1
214	Kingsmill	Wet well	Wet well	2	3	Good Concrete Corrosion	Continue Scheduled Maintenance Activities	7/2011: HRSD PM inspection on 11/19/2010 indicates some aggregate visible as well as a corroding fence around the hatch.	2
214	Kingsmill	Motor 1	Electrical Motor and Controller	1	1	Good	No Immediate Action Required	Digital - 709rpm, strobe - 708rpm	1
214	Kingsmill	Motor 2	Electrical Motor and Controller	1	1	Good Shaft Bearing Noise	No Immediate Action Required	Digital - 627rpm, strobe - 627rpm. Possible faint shaft bearing noise - not enough to affect rating. Motor whine pronounced at low speeds.	1
214	Kingsmill	Motor 3	Electrical Motor and Controller	1	1	Good	No Immediate Action Required	Digital - 7677pm, strobe - 670rpm. Motor whine pronounced at low speeds.	1
214	Kingsmill	Pump 1	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Stuffing box is not draining. Shaft has deflection at the pump coupling.	2
214	Kingsmill	Pump 2	Pump	3	3	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	The shaft makes noise. The stuffing box is overflowing.	2
214	Kingsmill	Pump 3	Pump	2	2	Good	No Immediate Action Required	The stuffing box is dry.	1
214	Kingsmill	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
214	Kingsmill	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valve #1 arm is leaking which is causing corrosion on the floor. Check valve #3 shows evidence of past leakage - floor corrosion.  7/11: HRSD inspections indicate that suction valve #2 is hard to operate.	1
214	Kingsmill	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

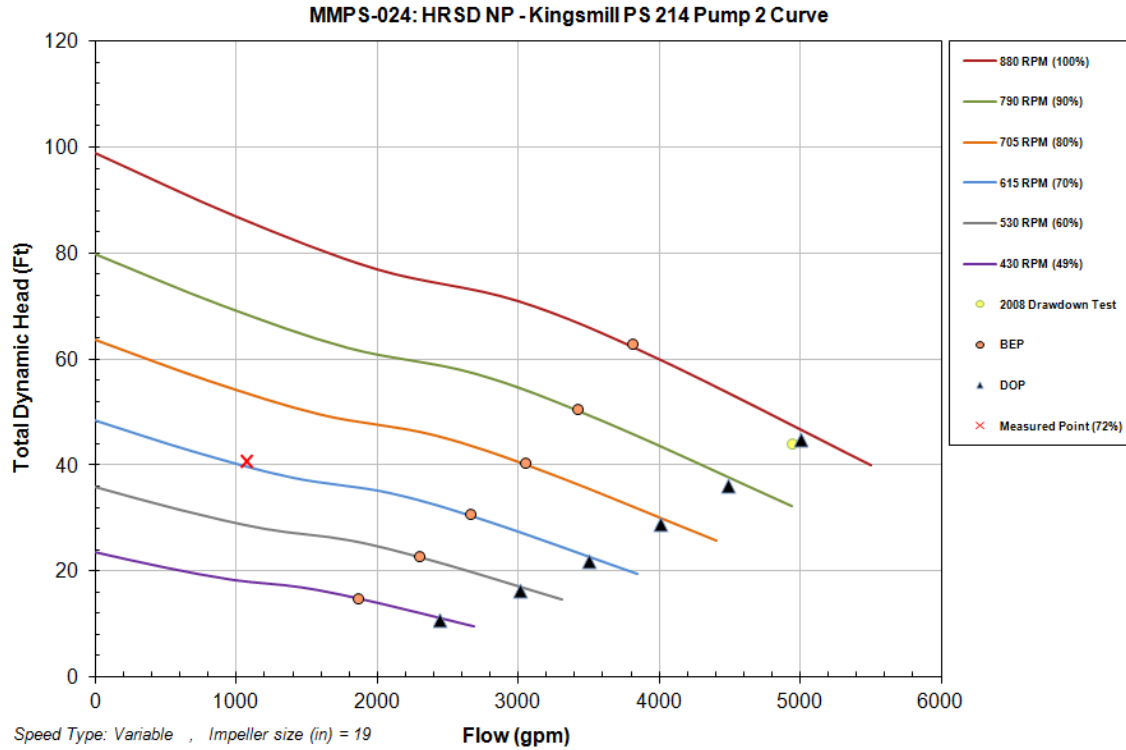
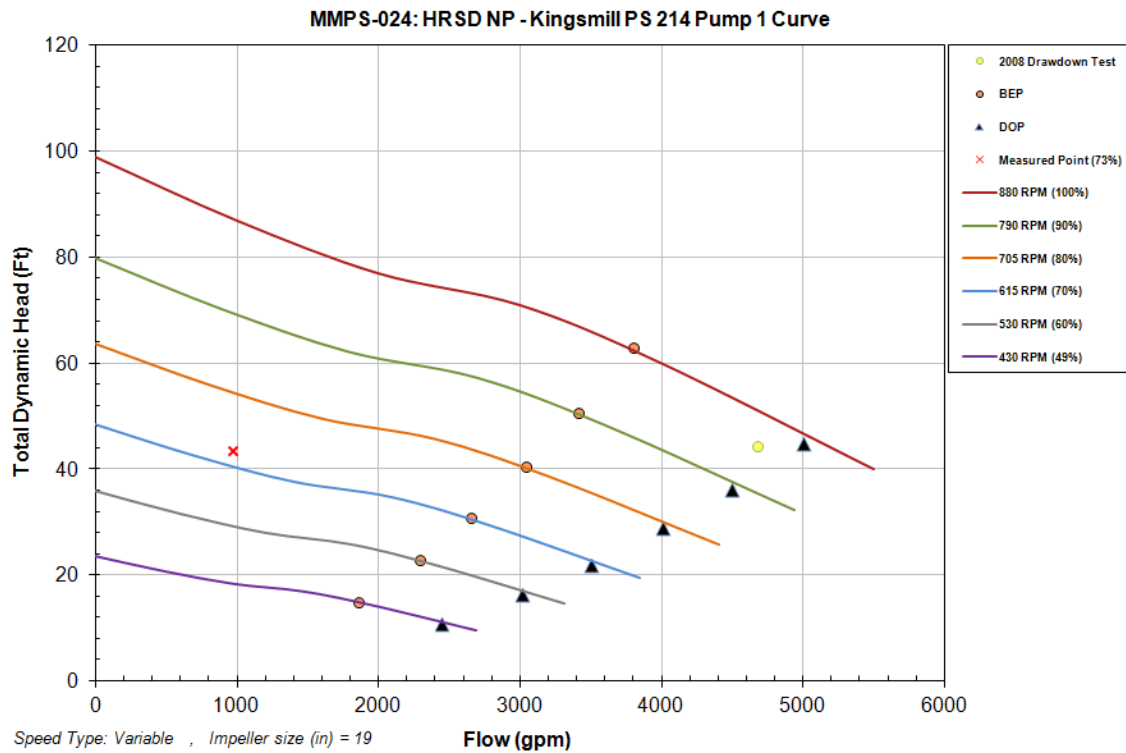
**Table 214-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
214	Kingsmill	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
214	Kingsmill	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
214	Kingsmill	Check Valve Pump 1	Check Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
214	Kingsmill	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
214	Kingsmill	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
214	Kingsmill	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
214	Kingsmill	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
214	Kingsmill	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
214	Kingsmill	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No Comment	1
214	Kingsmill	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
214	Kingsmill	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
214	Kingsmill	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
214	Kingsmill	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
214	Kingsmill	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
214	Kingsmill	SCADA	SCADA	4	2	No panel door grounding wire. Terminals not labeled. Uncapped wires loose in the panel.	Schedule Corrective Action	Corrosion forming on the panel.	3

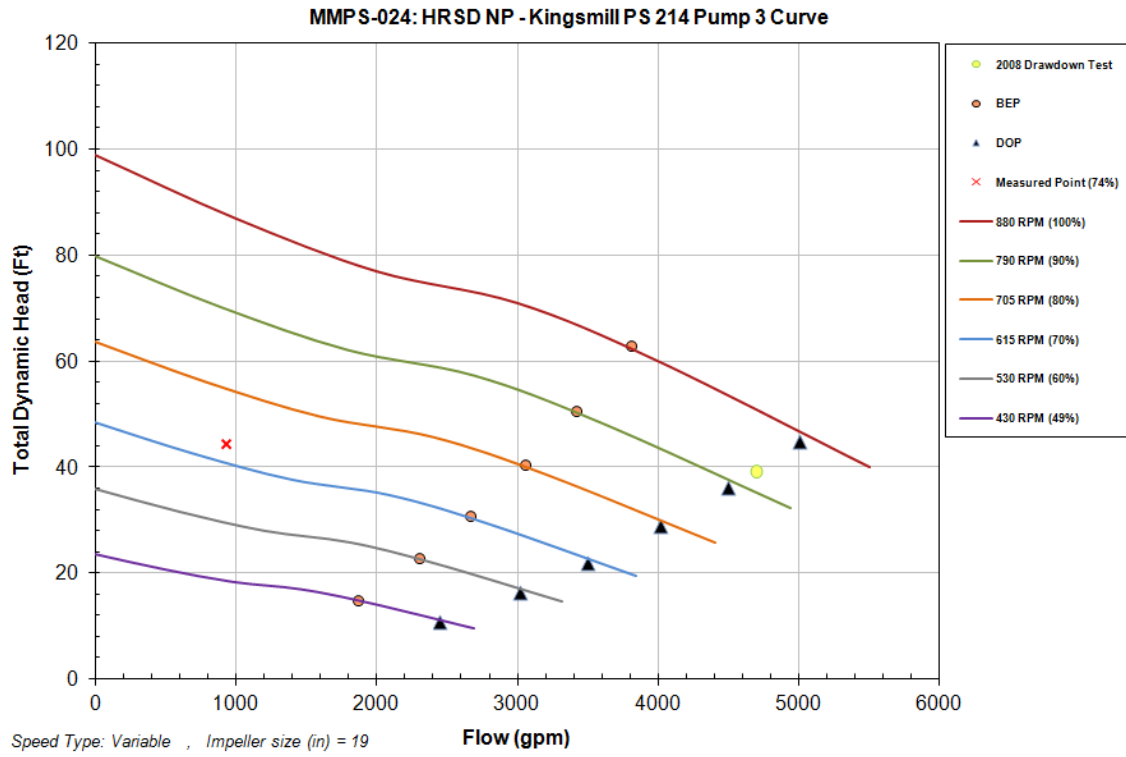
**Table 214-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
214	Kingsmill	Transfer Switch	Transfer Switch	1	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
214	Kingsmill	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	No Comment	1
214	Kingsmill	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
214	Kingsmill	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1
214	Kingsmill	Tank 1	In Built Fuel Tank	1	1	Good	No Immediate Action Required	No Comment	1

### Draw-Down Testing







## Kingsmill Assets of Interest

None.

## Kingsmill Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS, SCADA pull box, & Bubbler control panel are not bonded to the station grounding system

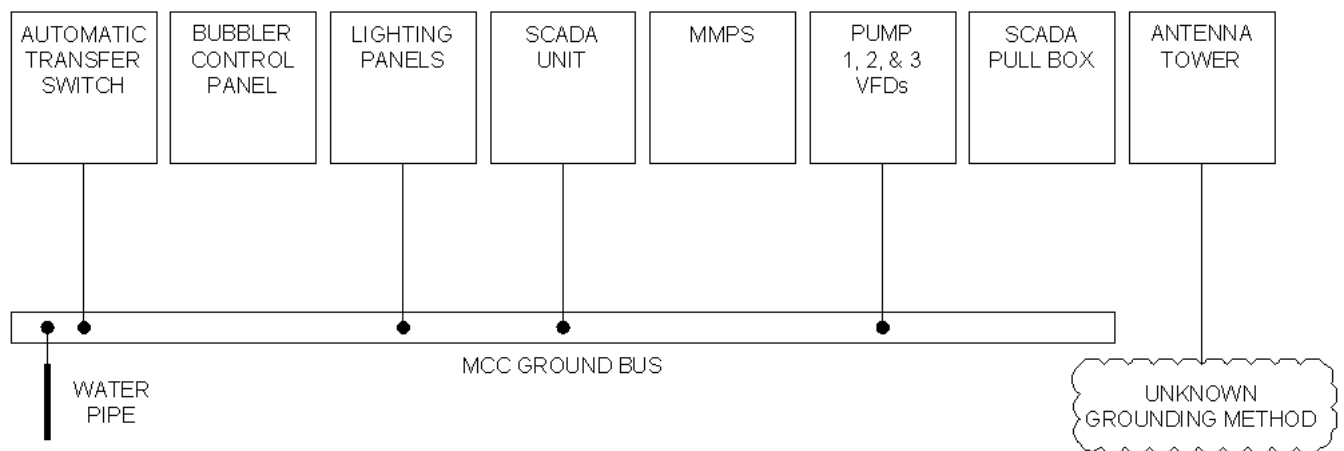


Figure 214-3. Kingsmill Grounding System

## Kingsmill Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions

- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PRS 215 Lee Hall Pressure Reducing Station

### Lee Hall Facility Description



Figure 215-1. Lee Hall PRS Location Map



Figure 215-2. Lee Hall PRS

**Table 215-1. Lee Hall PRS**

<b>Pumping Facility Number</b>	<b>215</b>
<b>Date of Initial Inspection</b>	<b>7/2/2008</b>
<b>Date of Update Inspection</b>	<b>6/15/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>8/4/2011</b>
<b>Date of Construction</b>	<b>1974</b>
<b>Address</b>	<b>17388 Warwick Blvd, Newport News</b>
<b>Receiving Facility</b>	<b>James River Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>65.5 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>8000 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>12000 GPM</b>
<b>Number of Pumps</b>	<b>3</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Fairbanks Morse</b>
<b>Pump Nameplate Capacity</b>	<b>4000 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>Reliance</b>
<b>Motor Nameplate Power (HP)</b>	<b>100</b>
<b>Generator Power (KW)</b>	<b>230</b>

### Lee Hall Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Lee Hall PRS is not in service because operation of the station was deemed to be unnecessary.

**Table 215-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
215	Lee Hall PRS	Building	Building	2	1	Good	No Immediate Action Required	No Comment	1
215	Lee Hall PRS	HVAC System	HVAC System	2	3	Good Low Detectable Airflow	Continue Scheduled Maintenance Activities	The dry well ventilation is weak.	2
215	Lee Hall PRS	Motor 1	Electrical Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	PRS not in service. Motors have a fluid coupling to control the pump speed.	2
215	Lee Hall PRS	Motor 2	Electrical Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	PRS not in service. Motors have a fluid coupling to control the pump speed.	2
215	Lee Hall PRS	Motor 3	Electrical Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	PRS not in service. Motors have a fluid coupling to control the pump speed.	2
215	Lee Hall PRS	Pump 1	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	PRS not in service. 26 psi on the suction side. 31 psi on the discharge side.	2
215	Lee Hall PRS	Pump 2	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	PRS not in service. 26 psi on the suction side. 31 psi on the discharge side.	2
215	Lee Hall PRS	Pump 3	Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	PRS not in service. 26 psi on the suction side. 31 psi on the discharge side.	2
215	Lee Hall PRS	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation. Check valve performance not assessed because pumps were not operated. Bypass check valve appeared to be operating properly.	1
215	Lee Hall PRS	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
215	Lee Hall PRS	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
215	Lee Hall PRS	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
215	Lee Hall PRS	Check Valve Pump 1	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
215	Lee Hall PRS	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2

**Table 215-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
215	Lee Hall PRS	Check Valve Pump 3	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
215	Lee Hall PRS	Bypass Check Valve	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
215	Lee Hall PRS	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
215	Lee Hall PRS	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
215	Lee Hall PRS	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
215	Lee Hall PRS	Electrical Equipment	Electrical Equipment	4	3	Panel Corroded Panel Obsolete Dust Inside Panel	Schedule Corrective Action	PRS Built in 1976, but was not used due to high pressure discharge into the forcemain. Mouse nests in the MCC.	3
215	Lee Hall PRS	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	No Comment	2
215	Lee Hall PRS	Control Panel	Control Panel	4	2	No panel door grounding wire is installed. Panel is aging.	Schedule Corrective Action	Consider upgrading panel.	3
215	Lee Hall PRS	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
215	Lee Hall PRS	SCADA	SCADA	3	3	No panel door grounding wire. Terminals not labeled.	Continue Scheduled Maintenance Activities	No Comment	2
215	Lee Hall PRS	Transfer Switch	Transfer Switch	4	2	None to Report	Schedule Corrective Action	Judged on appearance only. Equipment is old.	3
215	Lee Hall PRS	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	HRSD PMs genset regularly including operation.	1
215	Lee Hall PRS	Generator	Generator	2	1	Good	No Immediate Action Required	HRSD PMs genset regularly including operation.	1
215	Lee Hall PRS	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
215	Lee Hall PRS	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1



**Table 215-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
215	Lee Hall PRS	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing

Not Applicable

### Lee Hall Assets of Interest

None. Station is not in service.

### Lee Hall Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - SCADA unit, MMPS, & control panel are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system

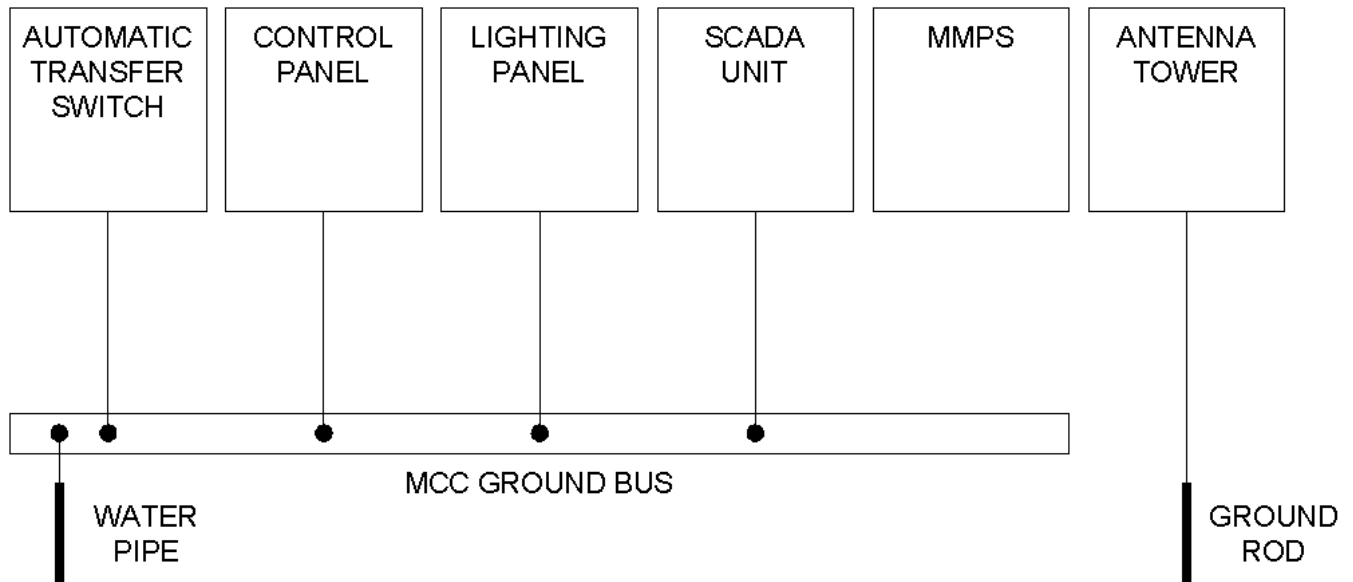


Figure 215-3. Lee Hall Grounding System

### Lee Hall Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel

- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 216 Lucas Creek Pump Station

### Lucas Creek Facility Description

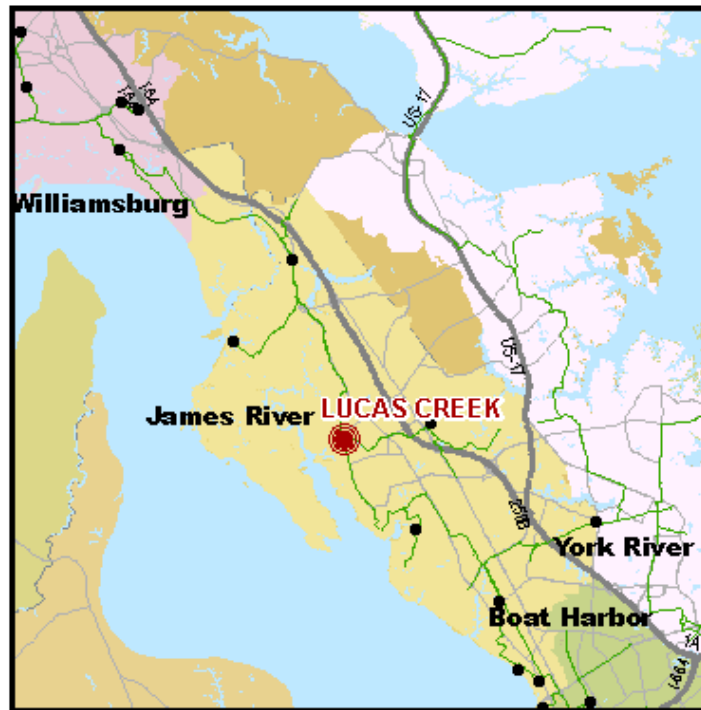


Figure 216-1. Lucas Creek Pump Station Location Map



Figure 216-2. Lucas Creek Pump Station

<b>Table 216-1. Lucas Creek PS</b>	
Pumping Facility Number	216
Date of Initial Inspection	6/30/2008
Date of Update Inspection	6/15/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/1/2011
Date of Construction	1970
Address	750 Lucas Creek Road, Newport News
Receiving Facility	James River Treatment Plant
Design Head (Feet)	59 ft.
Firm Pumping Capacity (GPM)	13700 GPM
Total Pumping Capacity (GPM)	19600 GPM
Number of Pumps	4
Pump Type	Centrifugal
Pump Manufacturer	Allis Chalmers
Pump Nameplate Capacity	5900 GPM, 5700 GPM, 4000 GPM, 4000 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Continental Electric (2), Allis Chalmers (2)
Motor Nameplate Power (HP)	125, 125, 100, 100
Generator Power (KW)	455

### Lucas Creek Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Motors and Pumps #1 and #2 have been out of service for over 10 years so they were not rated during the inspections.

Table 216-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
216	Lucas Creek	Building	Building	2	1	Good	No Immediate Action Required	Asbestos roof	1
216	Lucas Creek	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	The scrubber room fan is off of its mounting. The dry well fan has belt squeal at start up. The scrubber fan is not in service.	1
216	Lucas Creek	Wet well	Wet well	2	2	Good	No Immediate Action Required	7/2011: HRSD PM inspection on 11/05/2010 indicates that wet well has T-Lock rehab and is in good condition. The T-Lock is separating from the concrete near the influent line	1
216	Lucas Creek	Motor 3	Electrical Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Could not give performance score due to low flow conditions and short run times.	2
216	Lucas Creek	Motor 4	Electrical Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	Could not give performance score due to low flow conditions and short run times.	2
216	Lucas Creek	Pump 3	Pump	3	See Comments	Vibrating Shaft Deflection Cavitating	Continue Scheduled Maintenance Activities	Strobe = 886rpm. Could not run pumps long enough to make performance score due to low flow. Vibration is in shaft.	2
216	Lucas Creek	Pump 4	Pump	3	See Comments	Vibrating	Continue Scheduled Maintenance Activities	Strobe - 888rpm. Could not run pumps long enough to make performance score due to low flow.	2
216	Lucas Creek	Pump 5	Sump Pump	2	1	None to Report	No Immediate Action Required	No Comment	1
216	Lucas Creek	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
216	Lucas Creek	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
216	Lucas Creek	Suction Isolation Valve Pump 4	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
216	Lucas Creek	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

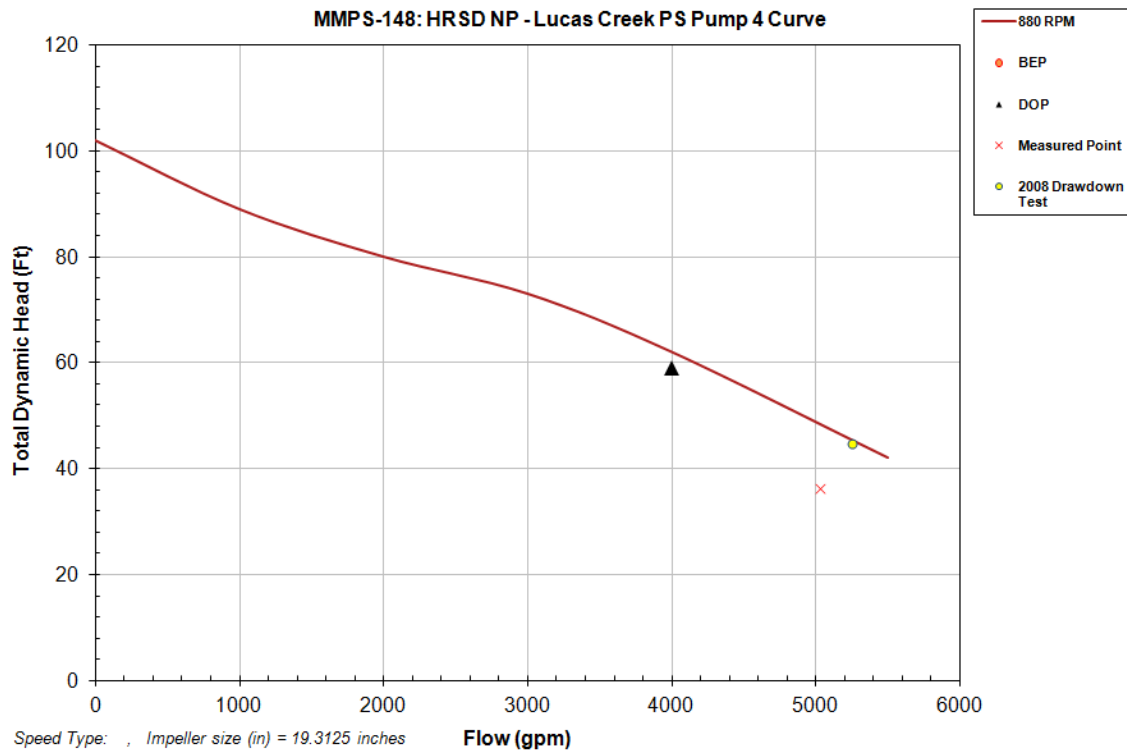
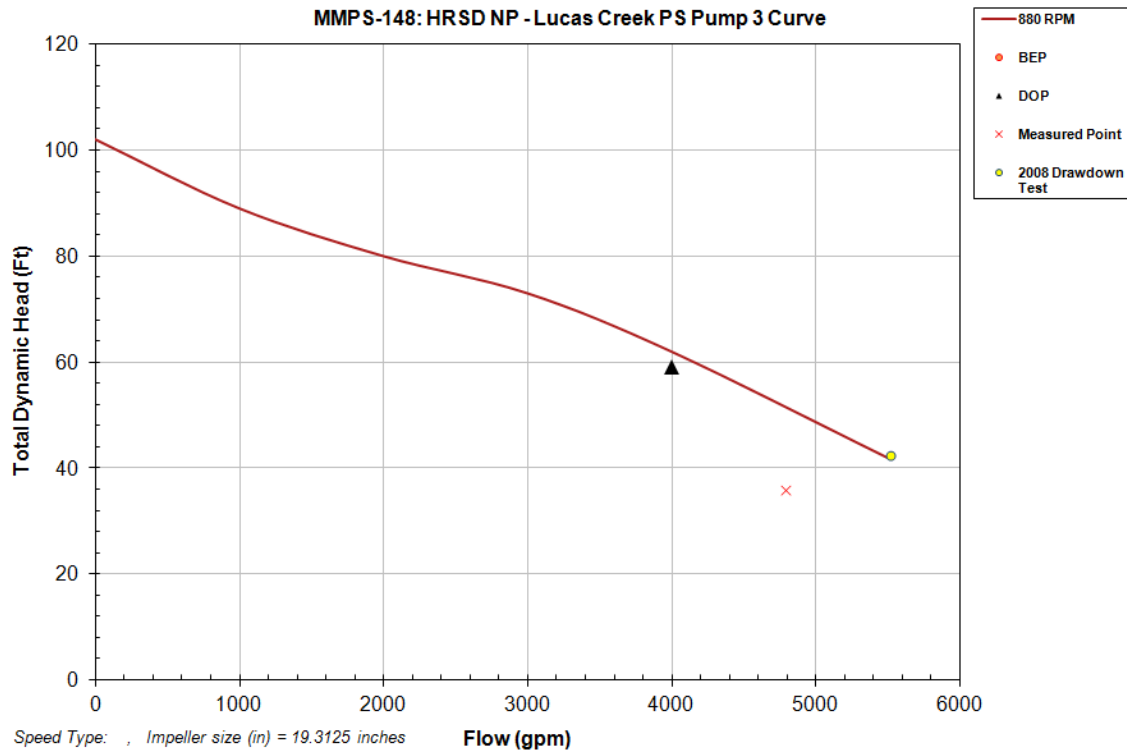
**Table 216-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
216	Lucas Creek	Check Valve Pump 4	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
216	Lucas Creek	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
216	Lucas Creek	Discharge Isolation Valve Pump 4	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
216	Lucas Creek	Electrical Equipment	Electrical Equipment	2	1	Good Cables Fatigued and Cracked Dust Inside Panel	No Immediate Action Required	No Comment	1
216	Lucas Creek	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
216	Lucas Creek	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
216	Lucas Creek	FLOmatcher	FLOmatcher	3	2	None to Report	Continue Scheduled Maintenance Activities	Equipment is well maintained but is old and should be considered for replacement.	2
216	Lucas Creek	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
216	Lucas Creek	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
216	Lucas Creek	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1
216	Lucas Creek	Transfer Switch	Transfer Switch	2	1	Good	No Immediate Action Required	Manufacturer - Westinghouse	1
216	Lucas Creek	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Block heater is very warm.	1
216	Lucas Creek	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
216	Lucas Creek	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
216	Lucas Creek	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1



Table 216-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
216	Lucas Creek	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing



### Lucas Creek Assets of Interest

None.

### Lucas Creek Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Control panel & gas monitoring panels are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS & gas monitoring panels are not bonded to the station grounding system

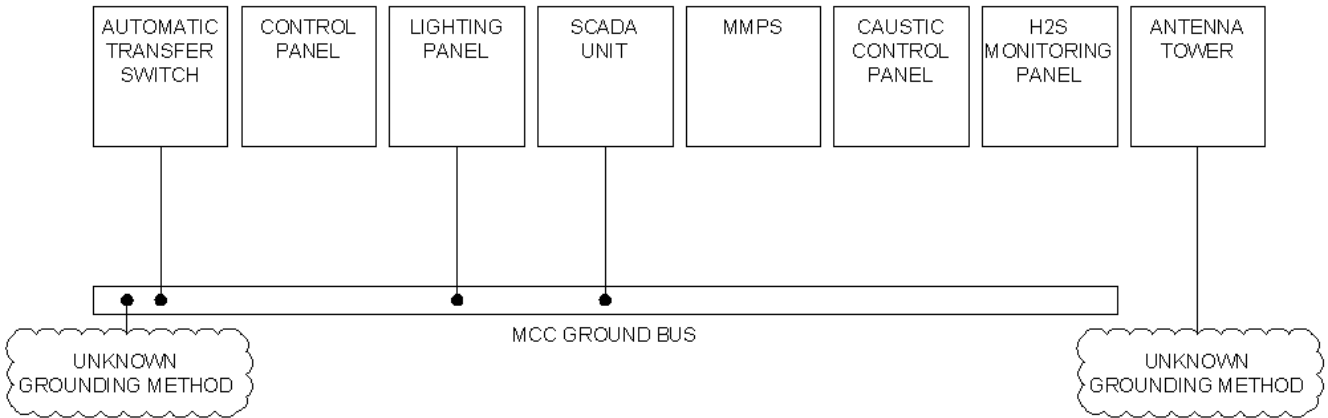


Figure 216-3. Lucas Creek Grounding System

### Lucas Creek Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available

- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 217 Langley Circle Pump Station

### Langley Circle Facility Description



Figure 217-1. Langley Circle Pump Station Location Map



Figure 217-2. Langley Circle Pump Station

<b>Table 217-1. Langley Circle PS</b>	
Pumping Facility Number	217
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/27/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1969
Address	4 Thomrose Ave, Hampton
Receiving Facility	York River Treatment Plant
Design Head (Feet)	70 ft.
Firm Pumping Capacity (GPM)	9000 GPM
Total Pumping Capacity (GPM)	13500 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Allis Chalmers
Pump Nameplate Capacity	4500 GPM
Standby Pump(s) present during inspection	12" Godwin CD300M
Motor Manufacturer	Marathon Electric (2), Continental Electric (1)
Motor Nameplate Power (HP)	125
Generator Power (KW)	None

### Langley Circle Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 217-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
217	Langley Circle	Building	Building	2	1	Good	No Immediate Action Required	12" Godwin pump onsite with transcube fuel tank. 2x 5 ton crane rails.	1
217	Langley Circle	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Scrubber fan has belt squeal.	1
217	Langley Circle	Wet well	Wet well	2	1	Good	No Immediate Action Required	Wet well was rehabilitated in 2002. 9/2011: HRSD PM inspection on 9/9/2011 indicates only minor changes from the 2008 wet well data.	1
217	Langley Circle	Influent Valve	Sluice Gate	2	4	Good	Corrective Action Required	Would not close fully on 9/9/2011. HRSD able to isolate wet well using other means.	4
217	Langley Circle	Motor 1	Motor and Controller	2	1	Good	No Immediate Action Required	Panel readout=647 RPM, Strobe Readout=650 RPM. Motors were rebuilt in Jan 2008. Lead pump day of test - running at 67%	1
217	Langley Circle	Motor 2	Motor and Controller	2	3	Good	Continue Scheduled Maintenance Activities	Strobe Readout=894 RPM. Pump would not operate in Auto-Mode (controls issue).	2
217	Langley Circle	Motor 3	Motor and Controller	2	1	Good	No Immediate Action Required	Panel readout=705 rpm, Strobe readout=707 rpm. Motors were rebuilt in Jan 2008.	1
217	Langley Circle	Motor	Odor Control Caustic Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
217	Langley Circle	Motor	Odor Control Blower Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
217	Langley Circle	Pump 1	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Vibration slight- likely from shaft deflection. Top end of pump is warm near the shaft coupling. Pump shafts are assembled with 2 pieces - Center bearing positioned so that shafts are not quite vertical.	2
217	Langley Circle	Pump 2	Pump	2	2	Good	No Immediate Action Required	Shaft made noise; difficult to hear pump. Pump base weeping from underneath. Pump shafts are assembled with 2 pieces - Center bearing positioned so that shafts are not quite vertical.	1
217	Langley Circle	Pump 3	Pump	3	2	Vibrating Cavitation	Continue Scheduled Maintenance Activities	Shaft made noise. Vibration seems like it is coming from the shaft. Pump made noise. Pump shaft is not vertical.	2
217	Langley Circle	Pump	Sump Pump	2	1	None to Report	No Immediate Action Required	No Comment	1

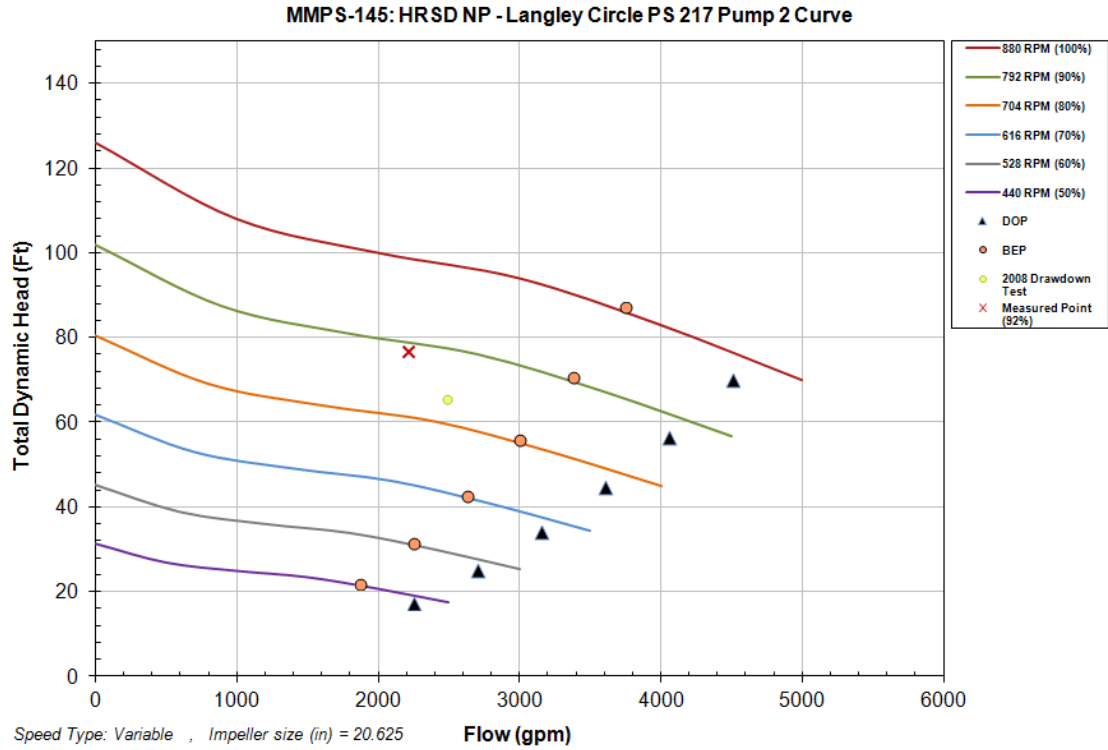
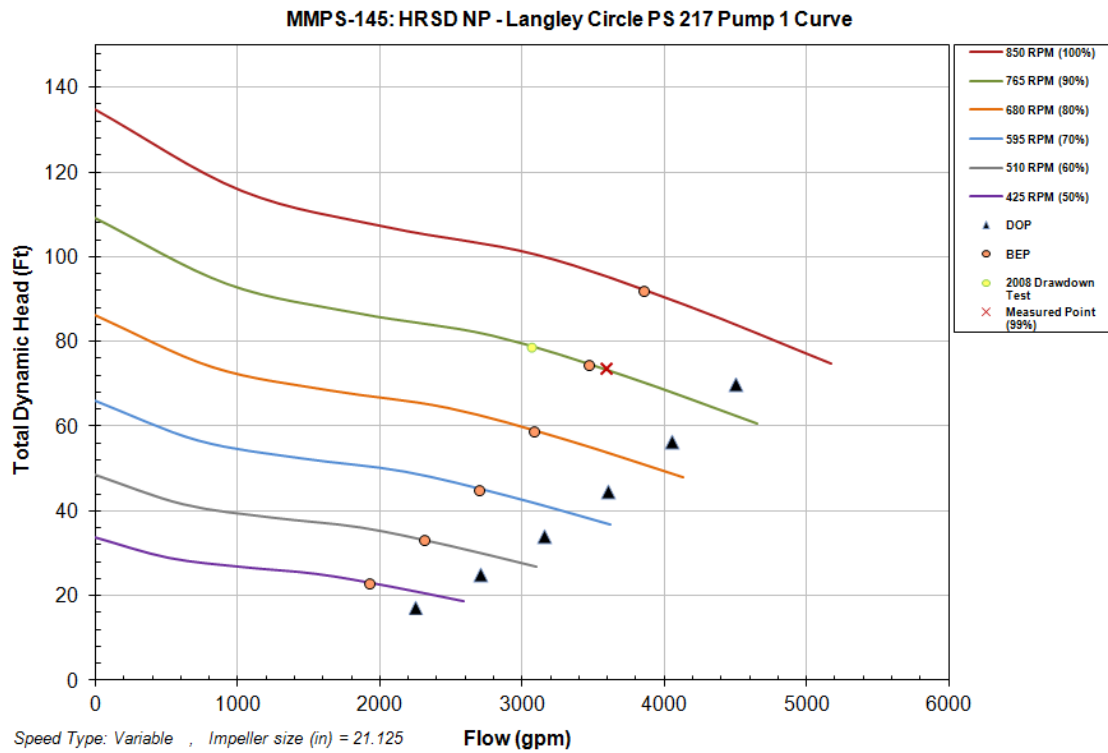
**Table 217-2. Pumping Facility Asset Condition and Performance Ratings**

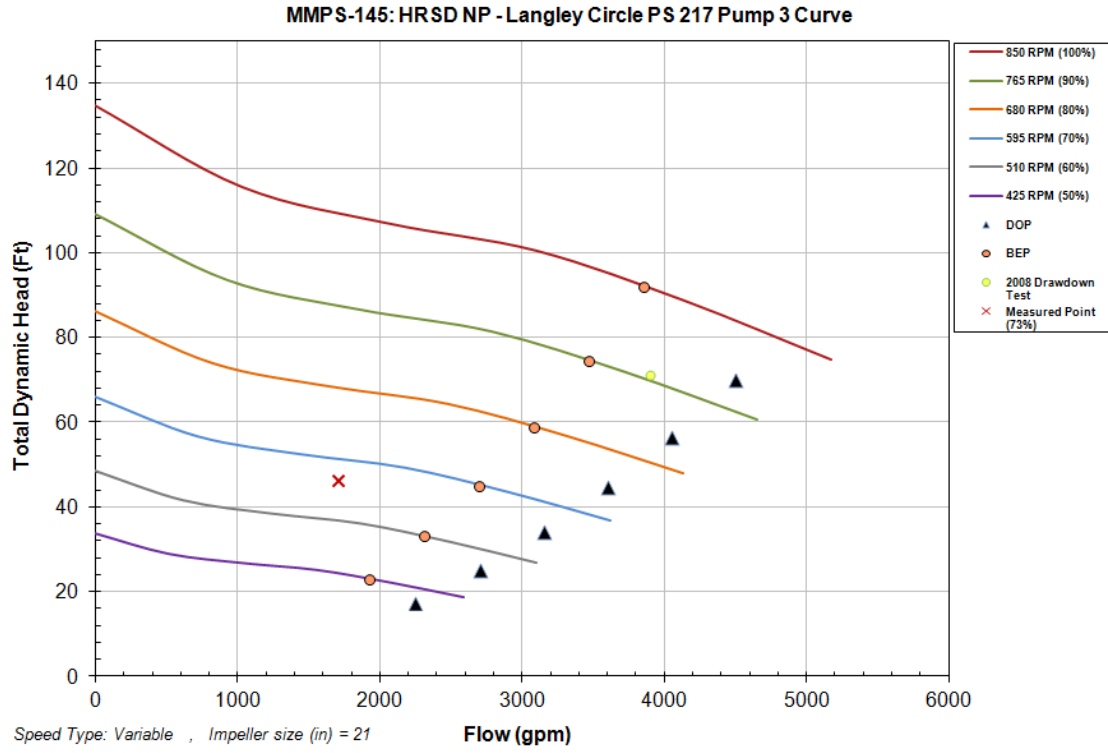
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
217	Langley Circle	Pump	Chemical Feed Pump	1	1	Good	No Immediate Action Required	No Comment	1
217	Langley Circle	Pump	Recirculation Pump	2	1	Good	No Immediate Action Required	No Comment	1
217	Langley Circle	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspection indicates suction valve #3 is tight.	1
217	Langley Circle	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
217	Langley Circle	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
217	Langley Circle	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	Alternate power feed instead of standby generator. Other electrical assets good.	1
217	Langley Circle	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
217	Langley Circle	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1



Table 217-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
217	Langley Circle	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
217	Langley Circle	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
217	Langley Circle	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
217	Langley Circle	SCADA	SCADA	1	1	Mounted in the bubbler control panel	No Immediate Action Required	No Comment	1
217	Langley Circle	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
217	Langley Circle	Transfer Switch	Transfer Switch	1	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No panel door grounding wire.	1
217	Langley Circle	Tank 1	Scrubber Tank	2	1	Good	No Immediate Action Required	No Comment	1
217	Langley Circle	Tank 2	Chemical Tank	2	1	Good	No Immediate Action Required	No Comment	1

### Draw-Down Testing





### Langley Circle Assets of Interest

None

### Langley Circle Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Control panels, velocity profiler, & gas monitoring panels are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS, velocity profiler, & gas monitoring panels are not bonded to the station grounding system

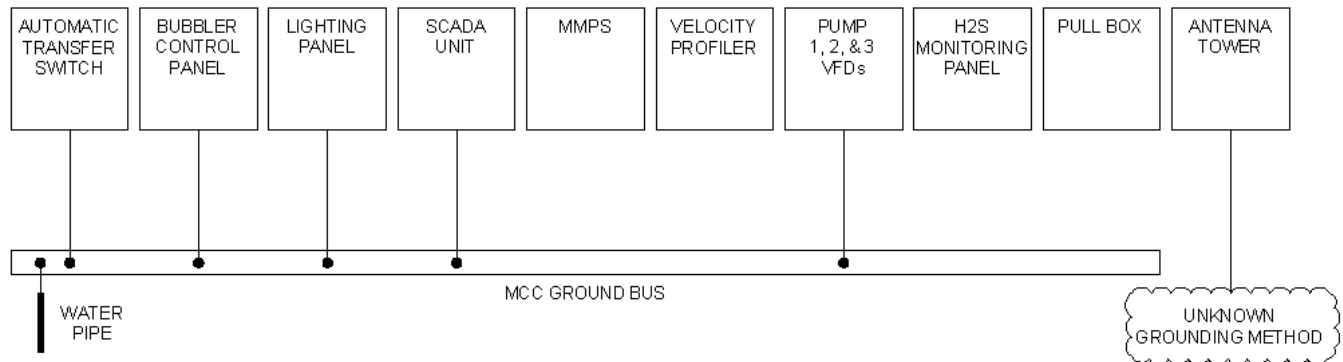


Figure 217-3. Langley Circle Grounding System

### Langley Circle Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable

- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other
  - Alternate power feed instead of standby generator

### Langley Circle Dual Power Feed Assessment

Information obtained from the local electrical utility indicates that this station has redundant transformers each with a different circuit feeding it from the utility. This station has two complete separate circuits each with a fuse and transformer. This station has complete redundancy but power losses are still possible.

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## PS 218 Morrison Ave Pump Station

### Morrison Ave Facility Description



Figure 218-1. Morrison Ave Pump Station Location Map



Figure 218-2. Morrison Ave Pump Station

<b>Table 218-1. Morrison PS</b>	
Pumping Facility Number	218
Date of Initial Inspection	6/30/2008
Date of Update Inspection	6/16/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/1/2011
Date of Construction	1955
Address	1228 Gatewood Rd, Newport News
Receiving Facility	James River Treatment Plant
Design Head (Feet)	60 ft., 67 ft.
Firm Pumping Capacity (GPM)	1500 GPM
Total Pumping Capacity (GPM)	3250 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1500 GPM, 1750 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M - Removed
Motor Manufacturer	Fairbanks Morse, U.S. Motors
Motor Nameplate Power (HP)	40, 50
Generator Power (KW)	75

### **Morrison Ave Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.



Table 218-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
218	Morrison	Building	Building	2	1	Good	No Immediate Action Required	Building has a new roof. A nearby power pole has a significant lean. Stays have been added to stabilize the pole.	1
218	Morrison	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	The dry well ventilation is weak and barely opens the louver.	1
218	Morrison	Wet well	Wet well	1	2	Good	No Immediate Action Required	7/2011: HRSD PM inspection on 2/28/2011 indicates no major changes from the 2008 wet well data. There was some sludge build-up that was cleared during the inspection.	1
218	Morrison	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
218	Morrison	Motor 1	Electrical Pump Motor and Controller	2	See Comments	Good	Continue Scheduled Maintenance Activities	VFD, strobe - 1193 rpm Could not listen to motor 1 closely due to low flow.	2
218	Morrison	Motor 2	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	Strobe = 599 rpm at 50% speed.	1
218	Morrison	Pump 1	Pump	2	1	Good	No Immediate Action Required	Test conditions: 0.9 fps, 350 gpm. Full power: 1.9 fps, 750 gpm	1
218	Morrison	Pump 2	Pump	3	3	Shaft Deflection Cavitating	Continue Scheduled Maintenance Activities	Slight shaft deflection. Cavitates at high speeds.	2
218	Morrison	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
218	Morrison	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1
218	Morrison	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

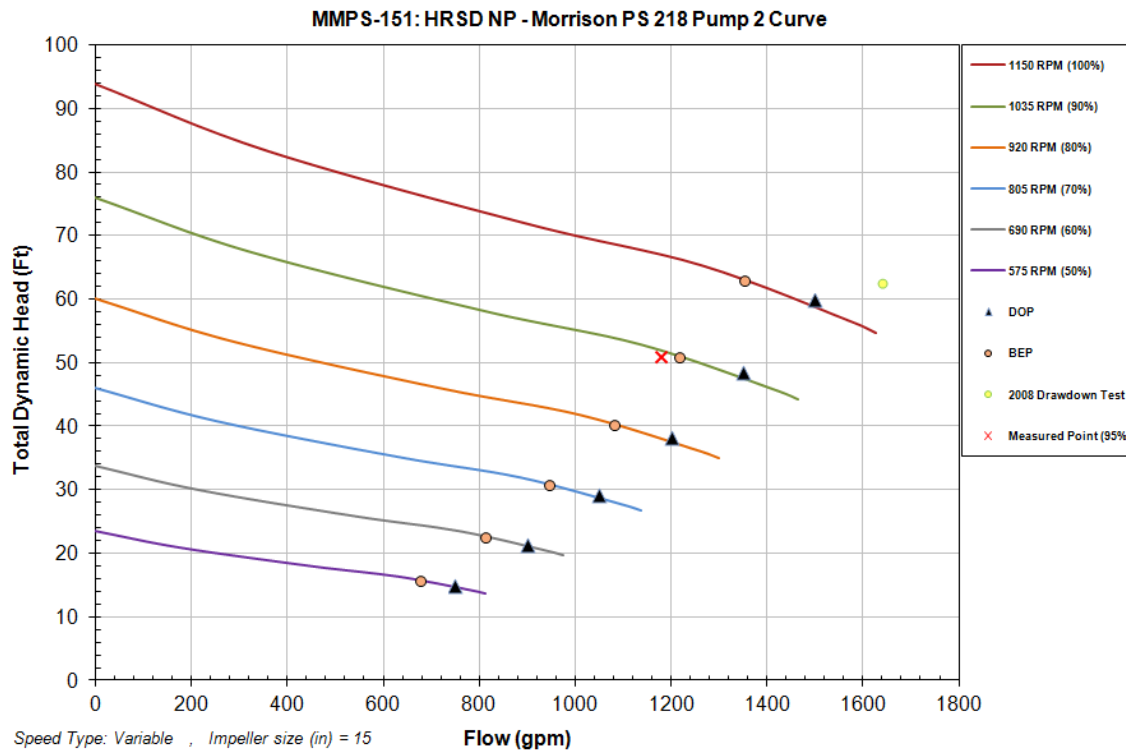
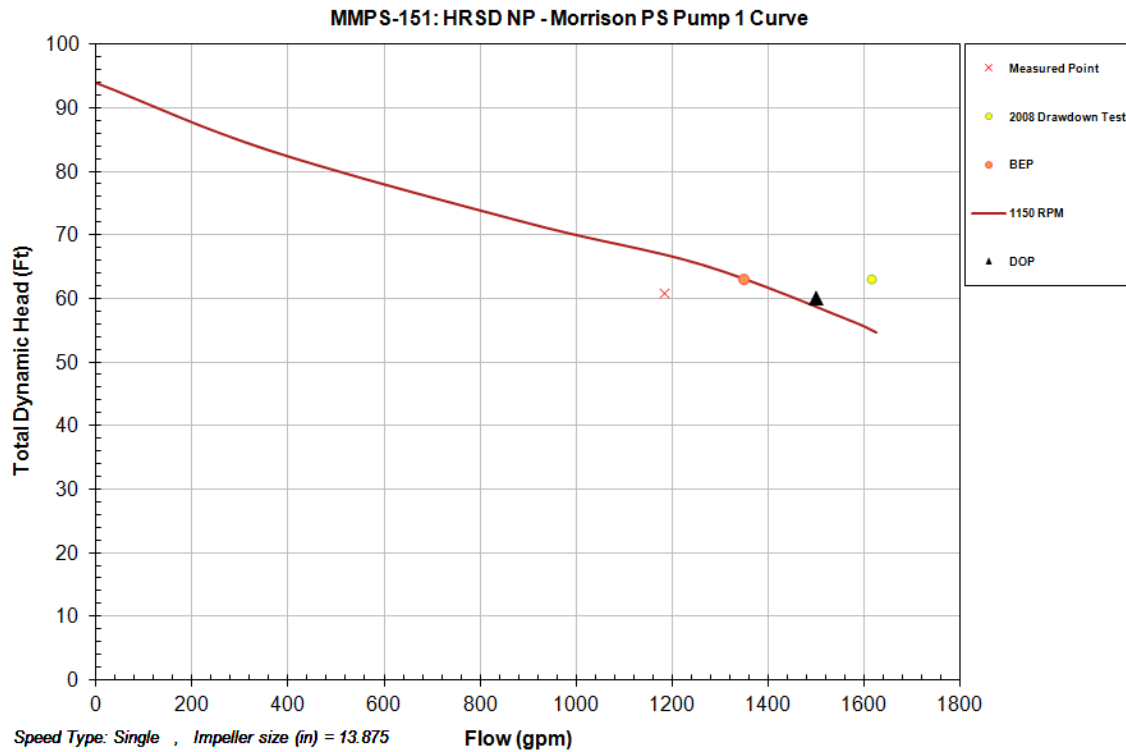
Table 218-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
218	Morrison	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
218	Morrison	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
218	Morrison	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
218	Morrison	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
218	Morrison	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
218	Morrison	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
218	Morrison	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
218	Morrison	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
218	Morrison	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
218	Morrison	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
218	Morrison	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

**Table 218-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
218	Morrison	SCADA	SCADA	3	2	No panel door grounding wire. Terminals not labeled. Subpanel is damaged.	Continue Scheduled Maintenance Activities	No Comment	2
218	Morrison	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
218	Morrison	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	Evidence of past leak. Fuel or oil on the floor.	1
218	Morrison	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
218	Morrison	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
218	Morrison	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
218	Morrison	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

## Draw-Down Testing



### Morrison Ave Assets of Interest

None.

### Morrison Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Velocity Profiler is not protected by a surge suppressor.
- Equipment properly Grounded:
  - Velocity Profiler & MMPS are not bonded to the station grounding system.

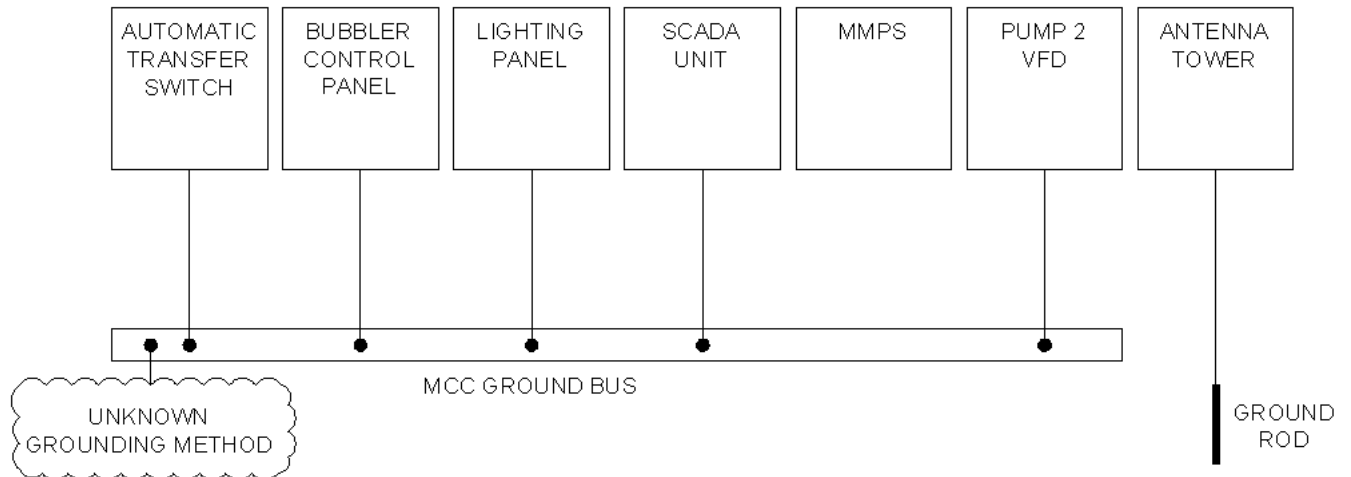


Figure 218-3. Morrison Ave Grounding System

### Morrison Ave Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged

- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 219 Newmarket Creek Pump Station

### Newmarket Creek Facility Description



Figure 219-1. Newmarket Creek Pump Station Location Map



Figure 219-2. Newmarket Creek Pump Station

<b>Table 219-1. Newmarket Creek PS</b>	
Pumping Facility Number	219
Date of Initial Inspection	6/27/2008
Date of Update Inspection	6/17/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/15/2011
Date of Construction	1953
Address	6000 Orcutt Ave, Newport News
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	39 ft., 36 ft.
Firm Pumping Capacity (GPM)	3400 GPM
Total Pumping Capacity (GPM)	5200 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1600 GPM, 1800 GPM, 1800 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric (2), Electro Dynamic (1)
Motor Nameplate Power (HP)	30, 30, 40
Generator Power (KW)	115

### Newmarket Creek Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



Table 219-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
219	Newmarket	Building	Building	2	2	Good Doors and Security Failing	No Immediate Action Required	Slate roof. Fence damaged. Nearby tree looks damaged possibly from H2S - due to location of damage on tree. The brick for the generator room walls are wavy from top to bottom - appears to have been built that way. The mortar has minor separation in places. New meter vault.	1
219	Newmarket	HVAC System	HVAC System	2	1	Good Low Detectable Airflow	No Immediate Action Required	Scrubber out of service. Louvers are wooden and aging. Dry well ventilation weak.	1
219	Newmarket	Wet well	Wet well	1	1	Good	No Immediate Action Required	Wet well rehabilitated and bar screen replaced in 2006. 7/2011: HRSD PM inspection on 12/15/2010 indicates no major changes from the 2008 wet well data.	1
219	Newmarket	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
219	Newmarket	Motor 1	Electrical Pump Motor and Controller	2	1	Good Makes Noise Vibrates	No Immediate Action Required	Strobe = 890rpm. Shaft vibration is causing motor to vibrate. Pronounced motor buzz. Motor is aging.	1
219	Newmarket	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe = 887rpm.	1
219	Newmarket	Motor 3	Electrical Pump Motor and Controller	2	2	Good Makes Noise	No Immediate Action Required	Strobe = 887rpm. Motor whine oscillates from high to low pitch without speed change.	1
219	Newmarket	Pump 1	Pump	3	2	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Noise from the seal area.	2

**Table 219-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
219	Newmarket	Pump 2	Pump	3	2	Vibrating	Continue Scheduled Maintenance Activities	Vibration only in upper portion of pump - likely from shaft. Pump #2 turned forward when pump #3 shut off. (pump #2 was off during symptom and for the entire time pump #3 was running)	2
219	Newmarket	Pump 3	Pump	3	2	Vibrating	Continue Scheduled Maintenance Activities	This pump has a smaller shaft than the other two. The shaft makes noise but the pump did not. Pump is standby only.	2
219	Newmarket	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Dry well.	1
219	Newmarket	Pump	Sump Pump	2	See Comments	Good	Continue Scheduled Maintenance Activities	Could not verify operation. Installed in cofferdam outside of station.	2
219	Newmarket	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Sump pump in meter vault.	1
219	Newmarket	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate possible wear due to nature of leaks for discharge valve #1.	1
219	Newmarket	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
219	Newmarket	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
219	Newmarket	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
219	Newmarket	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

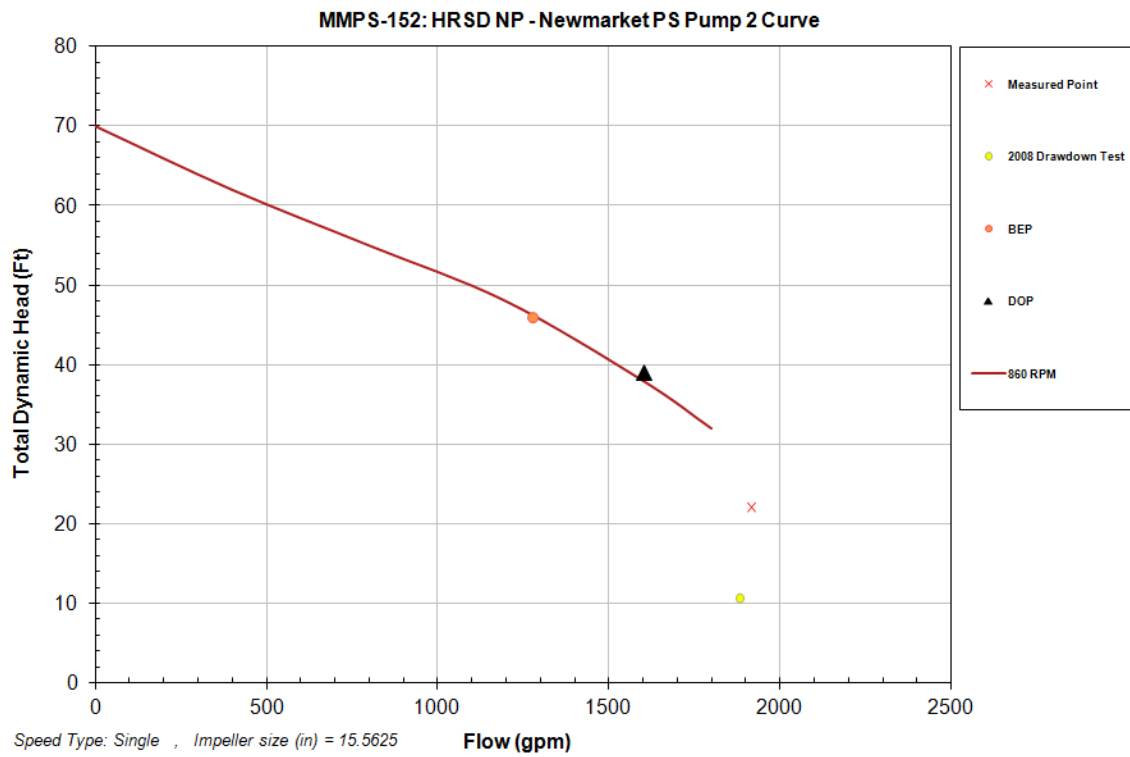
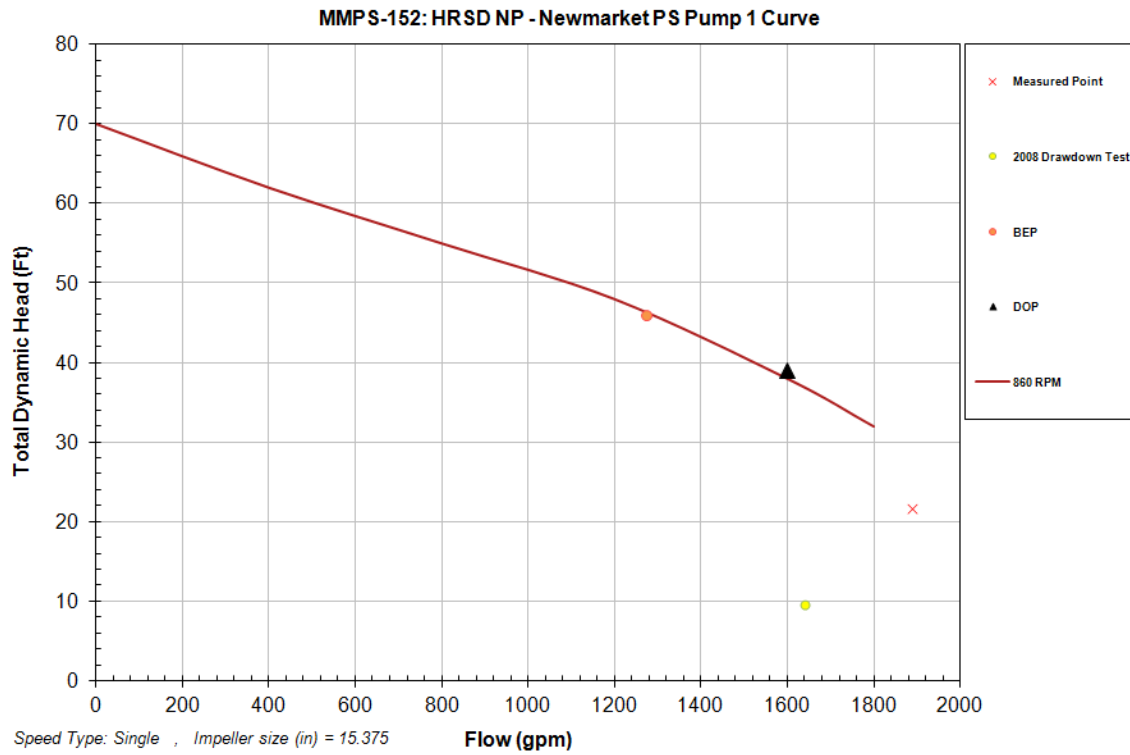
**Table 219-2. Pumping Facility Asset Condition and Performance Ratings**

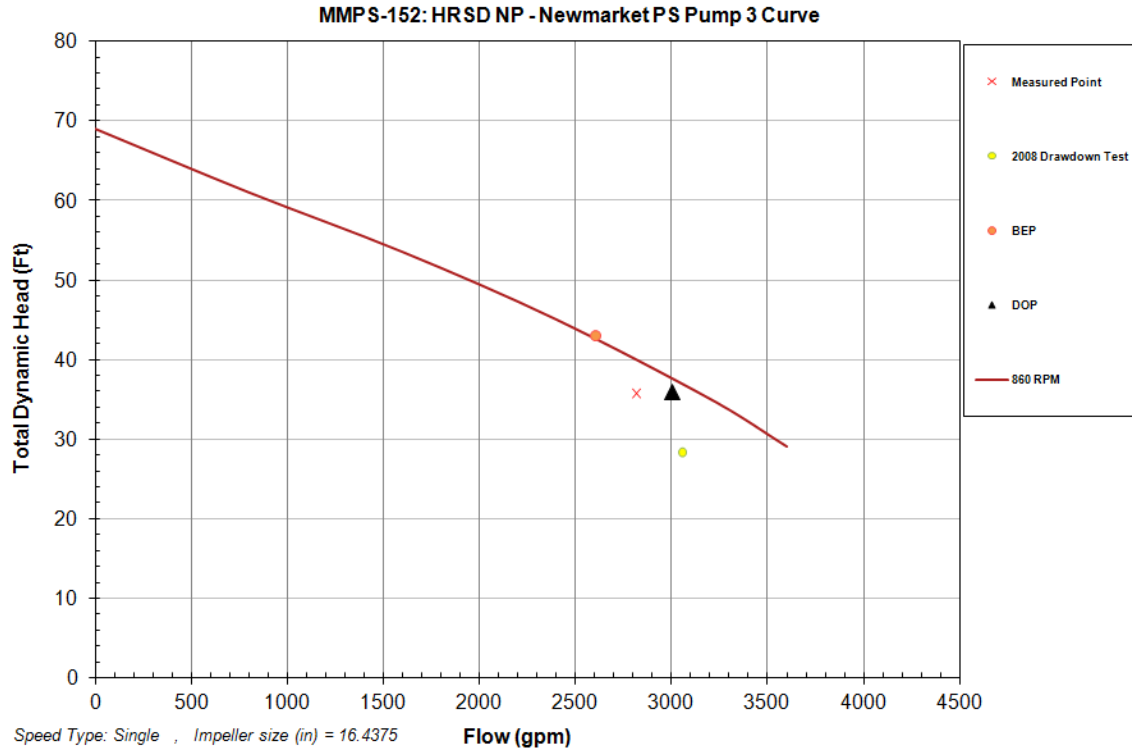
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
219	Newmarket	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
219	Newmarket	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
219	Newmarket	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	3	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
219	Newmarket	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
219	Newmarket	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
219	Newmarket	Electrical Equipment	Electrical Equipment	2	2	Good	No Immediate Action Required	No Comment	1
219	Newmarket	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
219	Newmarket	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
219	Newmarket	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
219	Newmarket	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
219	Newmarket	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled.	No Immediate Action Required	No Comment	1
219	Newmarket	Transfer Switch	Transfer Switch	4	2	Switch Corroded No Panel Door Grounding Wire	Schedule Corrective Action	Switch corroded. Did not transfer during preventive maintenance.	3

**Table 219-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
219	Newmarket	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
219	Newmarket	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
219	Newmarket	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
219	Newmarket	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
219	Newmarket	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level. Has observation well.	1

### Draw-Down Testing





## Newmarket Creek Assets of Interest

The Newmarket Creek Transfer switch is corroding and did not transfer during preventive maintenance.

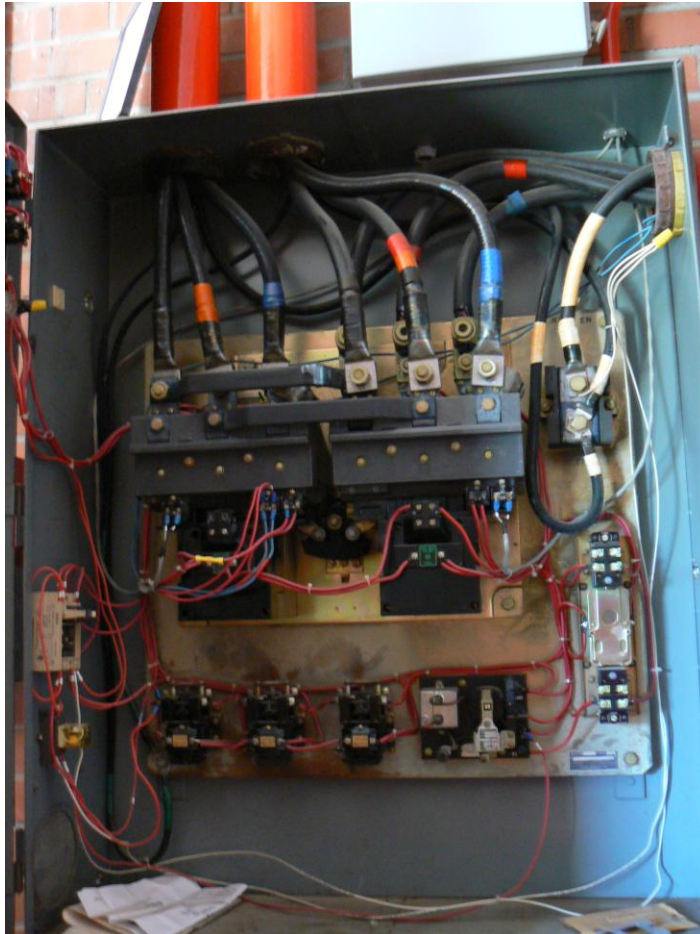


Figure 219-3. Newmarket Creek Transfer Switch

## Newmarket Creek Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment properly Grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system.

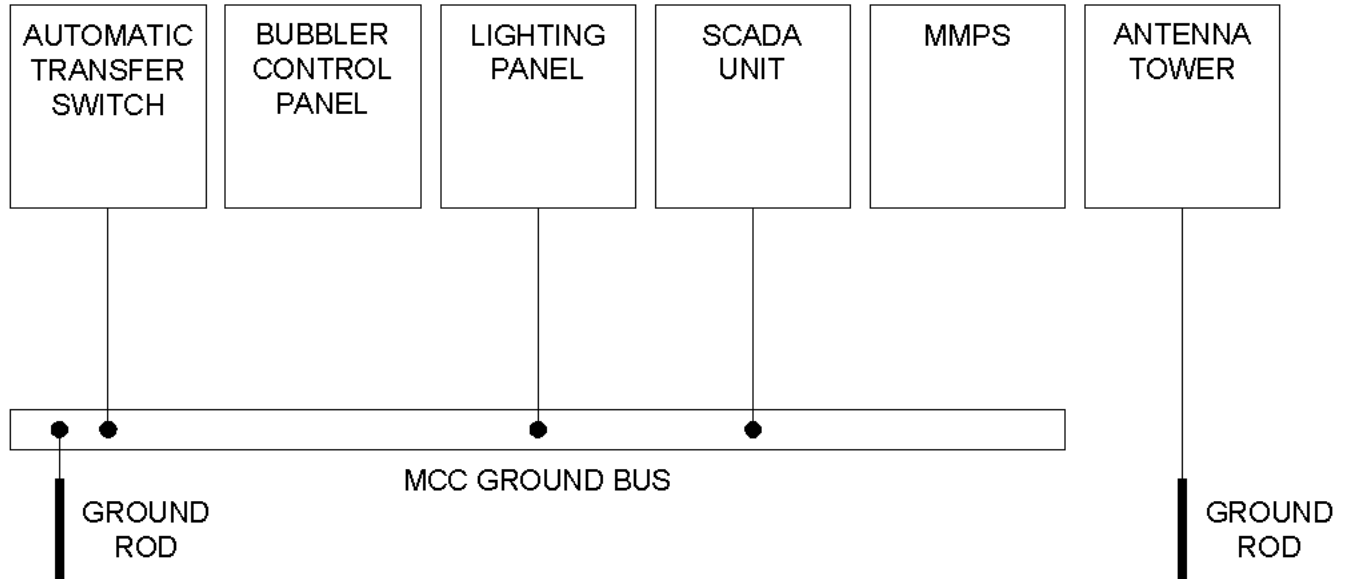


Figure 219-4. Newmarket Creek Grounding System

### Newmarket Creek Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion



- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 220 Normandy Ln Pump Station

### Normandy Ln Facility Description

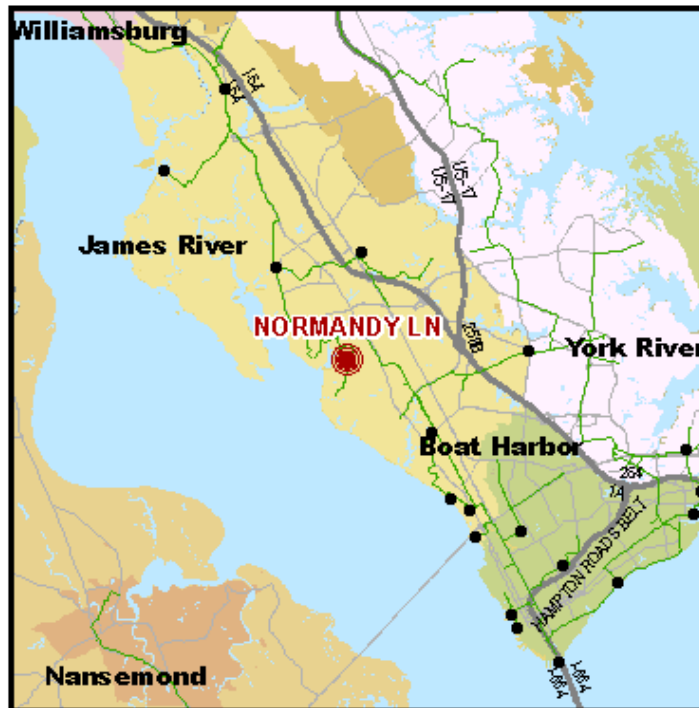


Figure 220-1. Normandy Lane Pump Station Location Map



Figure 220-2. Normandy Lane Pump Station

<b>Table 220-1. Normandy Ln PS</b>	
<b>Pumping Facility Number</b>	<b>220</b>
<b>Date of Initial Inspection</b>	<b>6/20/2008</b>
<b>Date of Update Inspection</b>	<b>6/16/2011</b>
<b>Date of Electrical and Grounding/Lightning Strike Protection Inspection</b>	<b>8/1/2011</b>
<b>Date of Construction</b>	<b>1968</b>
<b>Address</b>	<b>116 Normandy Lane, Newport News</b>
<b>Receiving Facility</b>	<b>James River Treatment Plant</b>
<b>Design Head (Feet)</b>	<b>52 ft.</b>
<b>Firm Pumping Capacity (GPM)</b>	<b>600 GPM</b>
<b>Total Pumping Capacity (GPM)</b>	<b>2000 GPM</b>
<b>Number of Pumps</b>	<b>2</b>
<b>Pump Type</b>	<b>Centrifugal</b>
<b>Pump Manufacturer</b>	<b>Worthington</b>
<b>Pump Nameplate Capacity</b>	<b>600 GPM, 1400 GPM</b>
<b>Standby Pump(s) present during inspection</b>	<b>None</b>
<b>Motor Manufacturer</b>	<b>General Electric</b>
<b>Motor Nameplate Power (HP)</b>	<b>20, 40</b>
<b>Generator Power (KW)</b>	<b>100</b>

### **Normandy Ln Results of Evaluation**

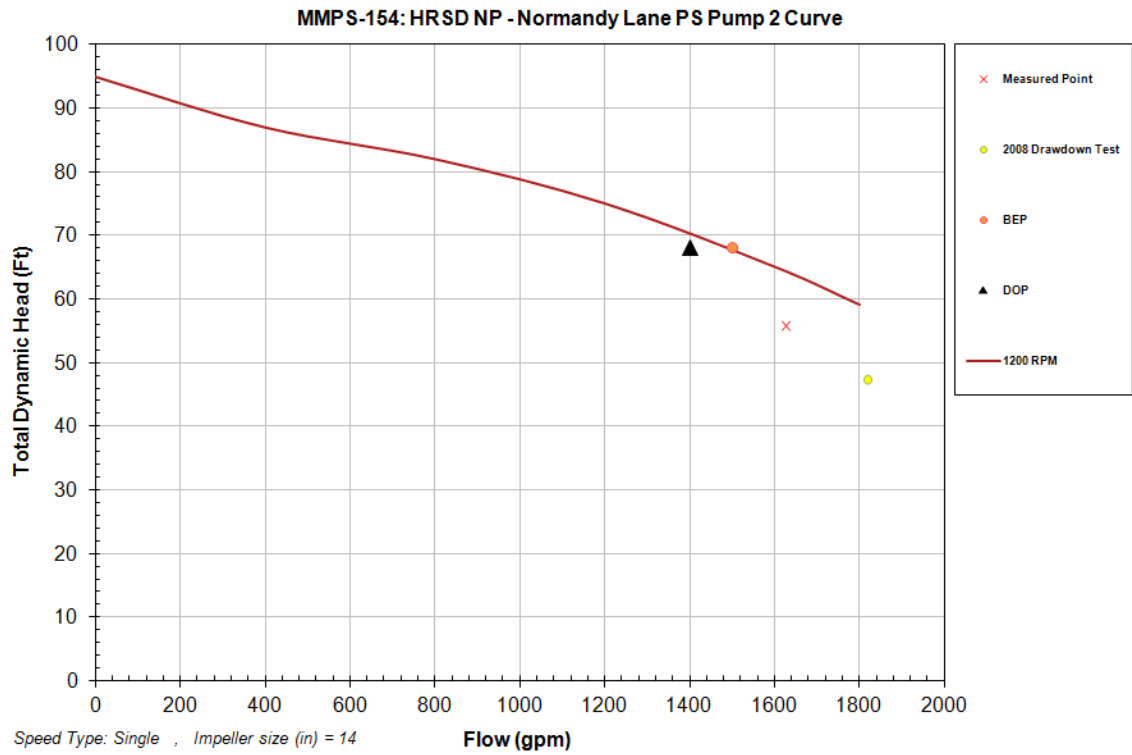
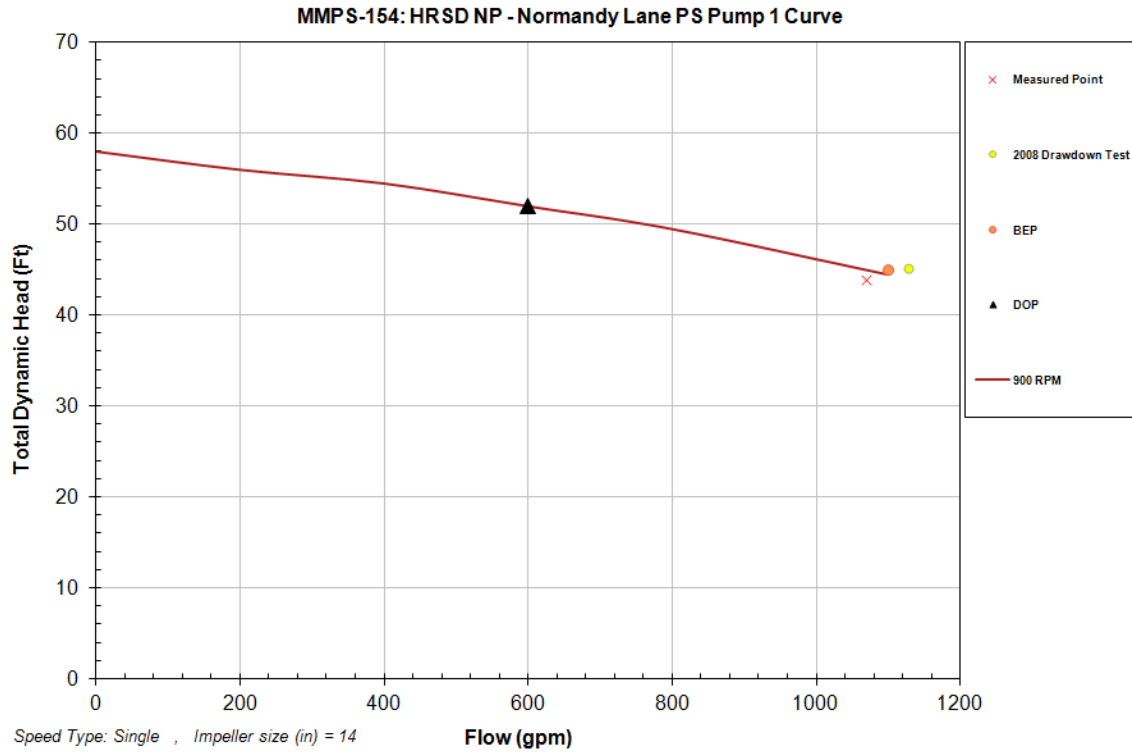
Results from the pumping facility field inspections are summarized in the following table.

Table 220-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
220	Normandy Lane	Building	Building	2	1	Good	No Immediate Action Required	The mowers were on site during inspection.	1
220	Normandy Lane	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	The fan in the diesel tank room is not in service.	1
220	Normandy Lane	Wet well	Wet well	2	1	Good	No Immediate Action Required	No fall protection. T-Lock Rehab in place. 10/2011: HRSD PM inspection on 10/06/2011 indicates no major changes from the 2008 wet well data.	1
220	Normandy Lane	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
220	Normandy Lane	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
220	Normandy Lane	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
220	Normandy Lane	Pump 1	Pump	2	1	Good	No Immediate Action Required	Model - 5FMV16. Could not verify impeller diameter. 20 HP. Pump 1 test conditions: 1600 GPM, 6.5 fps.	1
220	Normandy Lane	Pump 2	Pump	3	2	Vibrating Cavitating	Continue Scheduled Maintenance Activities	Noisier than Pump #1, but not indicative of impending failure. TDH IS 68', 40 hp. Pump 2 test conditions: 1300 gpm, 5.7 fps	2
220	Normandy Lane	Pump	Sump Pump	1	1	Good	No Immediate Action Required	No Comment	1
220	Normandy Lane	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	7/11: HRSD inspections indicate no problems with isolation valve operation.	1

Table 220-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
220	Normandy Lane	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
220	Normandy Lane	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
220	Normandy Lane	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
220	Normandy Lane	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
220	Normandy Lane	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
220	Normandy Lane	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
220	Normandy Lane	Electrical Equipment	Electrical Equipment	2	2	Good	No Immediate Action Required	No Comment	1
220	Normandy Lane	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
220	Normandy Lane	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed. Panel is aging	Continue Scheduled Maintenance Activities	No Comment	2
220	Normandy Lane	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
220	Normandy Lane	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1

Table 220-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
220	Normandy Lane	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled.	No Immediate Action Required	No Comment	1
220	Normandy Lane	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No panel door grounding wire.	1
220	Normandy Lane	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
220	Normandy Lane	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
220	Normandy Lane	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Charger - 20 amps	1
220	Normandy Lane	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	2'X3'X8"	1
220	Normandy Lane	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Normandy Ln Assets of Interest

None.

### Normandy Ln Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 1 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment properly Grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system.

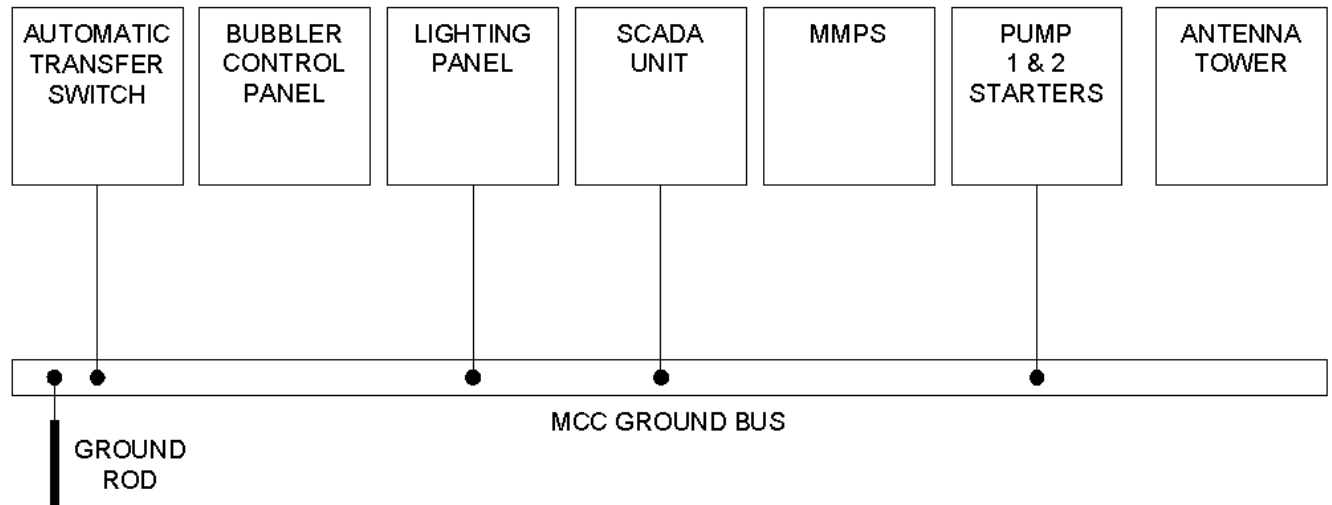


Figure 220-3. Normandy Ln Grounding System

### Normandy Ln Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment

- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 221 Patrick Henry Pump Station

### Patrick Henry Facility Description

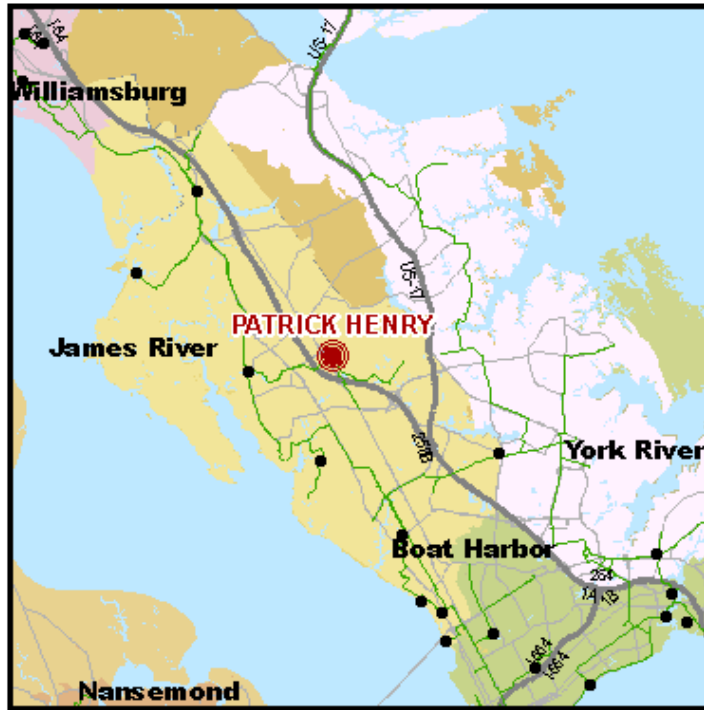


Figure 221-1. Patrick Henry Pump Station Location Map



Figure 221-2. Patrick Henry Pump Station

<b>Table 221-1. Patrick Henry PS</b>	
Pumping Facility Number	221
Date of Initial Inspection	6/20/2008
Date of Update Inspection	6/15/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/1/2011
Date of Construction	1943
Address	215 G Avenue, Newport News
Receiving Facility	James River Treatment Plant
Design Head (Feet)	83.4 ft./56 ft.
Firm Pumping Capacity (GPM)	3700 GPM / 2000 GPM
Total Pumping Capacity (GPM)	7400 GPM / 4000 GPM
Number of Pumps	2
Pump Type	Dry-pit Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	3700 GPM / 2000 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	118
Generator Power (KW)	300

### Patrick Henry Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

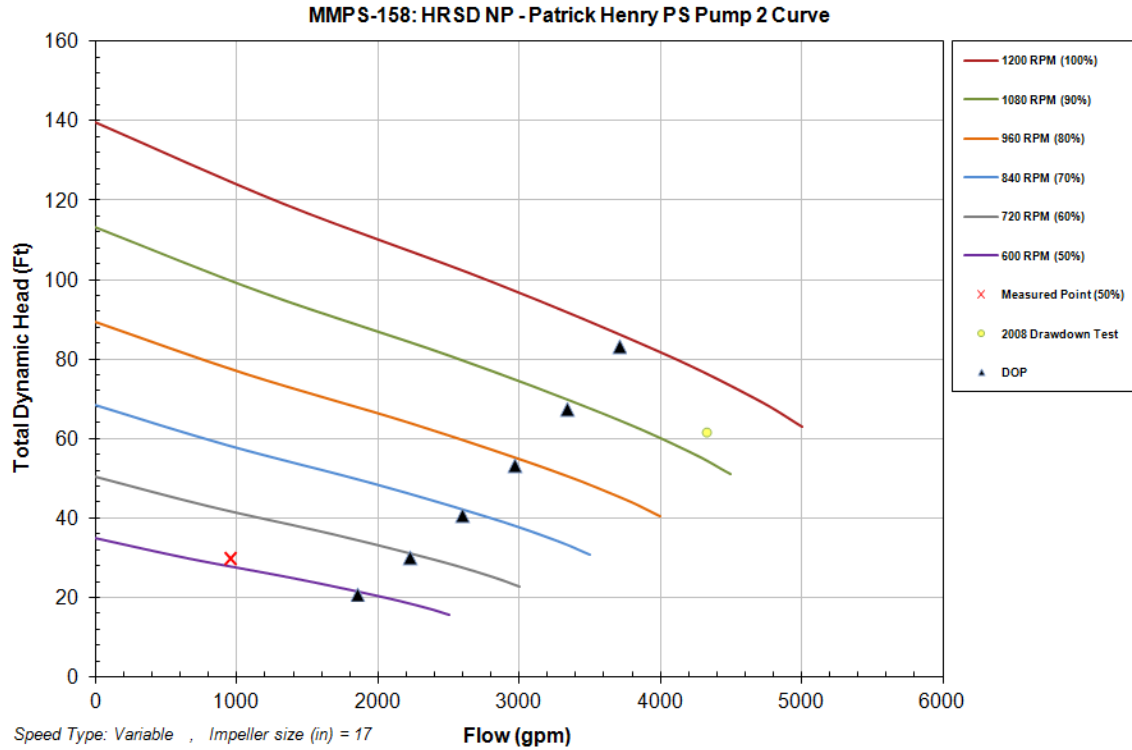
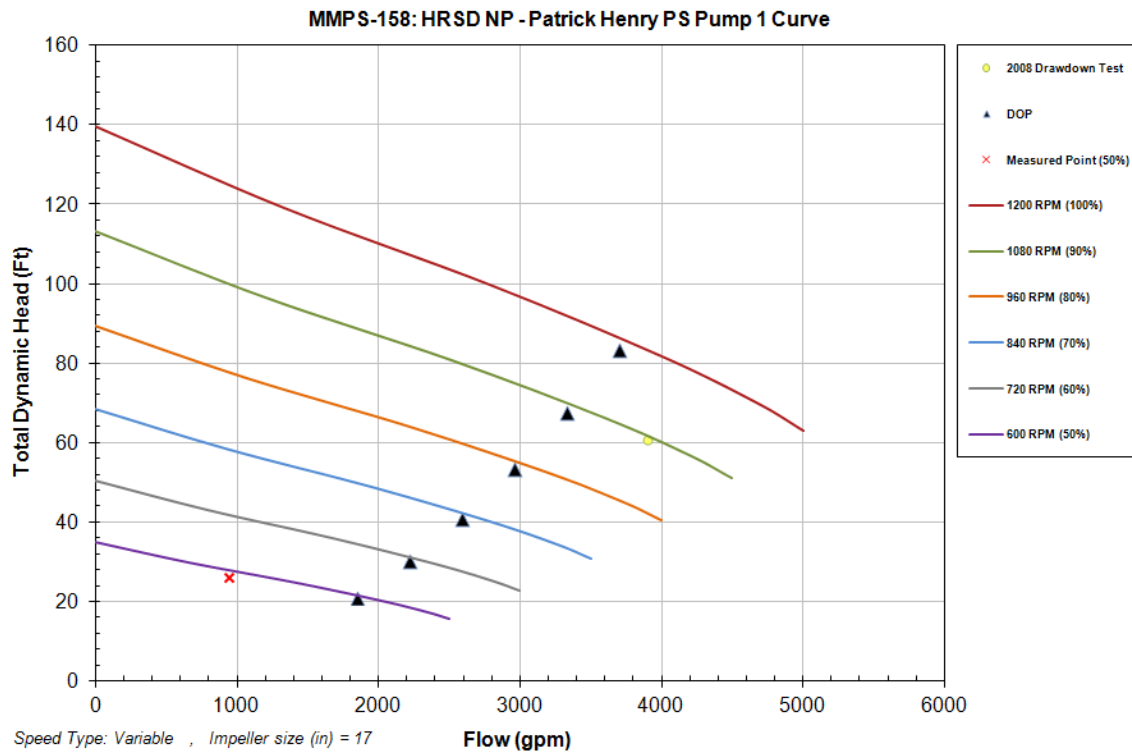
Table 221-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
221	Patrick Henry	Building	Building	2	1	Good	No Immediate Action Required	During 2011 visit, a new flow meter was being installed. There is a weep in the dry well along the wet well wall.	1
221	Patrick Henry	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Ventilation is weak.	1
221	Patrick Henry	Wet well	Wet well	2	1	Good	No Immediate Action Required	Recently rehabilitated. 7/2011: HRSD PM inspection on 4/26/2011 indicates no major changes from the 2008 wet well data.	1
221	Patrick Henry	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	rpm is 1175, 60 hz. Ident # - U125D2376K2X 1131A. Motor HP is 118.	1
221	Patrick Henry	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	RPM is 1175, 60 hz. Ident # - U125D2376K2X 1131A. Motor HP is 118	1
221	Patrick Henry	Pump 1	Pump	2	1	Good	No Immediate Action Required	Pumps didn't run over 50% during inspection.	1
221	Patrick Henry	Pump 2	Pump	2	1	Good	No Immediate Action Required	Pumps didn't run over 50% during inspection.	1
221	Patrick Henry	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
221	Patrick Henry	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Suction Valves: Pump #1 is 10" and Pump #2 is 12". Discharge valve #1 drips. Check #2 has a slight audible slam on closure and the arm is dripping. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
221	Patrick Henry	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
221	Patrick Henry	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 221-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
221	Patrick Henry	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
221	Patrick Henry	Check Valve Pump 2	Check Valve	3	2	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
221	Patrick Henry	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
221	Patrick Henry	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
221	Patrick Henry	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No Comment	1
221	Patrick Henry	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
221	Patrick Henry	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
221	Patrick Henry	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
221	Patrick Henry	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
221	Patrick Henry	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
221	Patrick Henry	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1
221	Patrick Henry	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	Install panel door ground wire	1
221	Patrick Henry	Engine	Generator Drive Engine	3	1	Leaking Fluids	Continue Scheduled Maintenance Activities	Minor oil leak. No information found for the engine. No nameplate.	2
221	Patrick Henry	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1

Table 221-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
221	Patrick Henry	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Emergency generator	1
221	Patrick Henry	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	30" X 18" X 24" size	1
221	Patrick Henry	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Patrick Henry Assets of Interest

None.

### Patrick Henry Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system

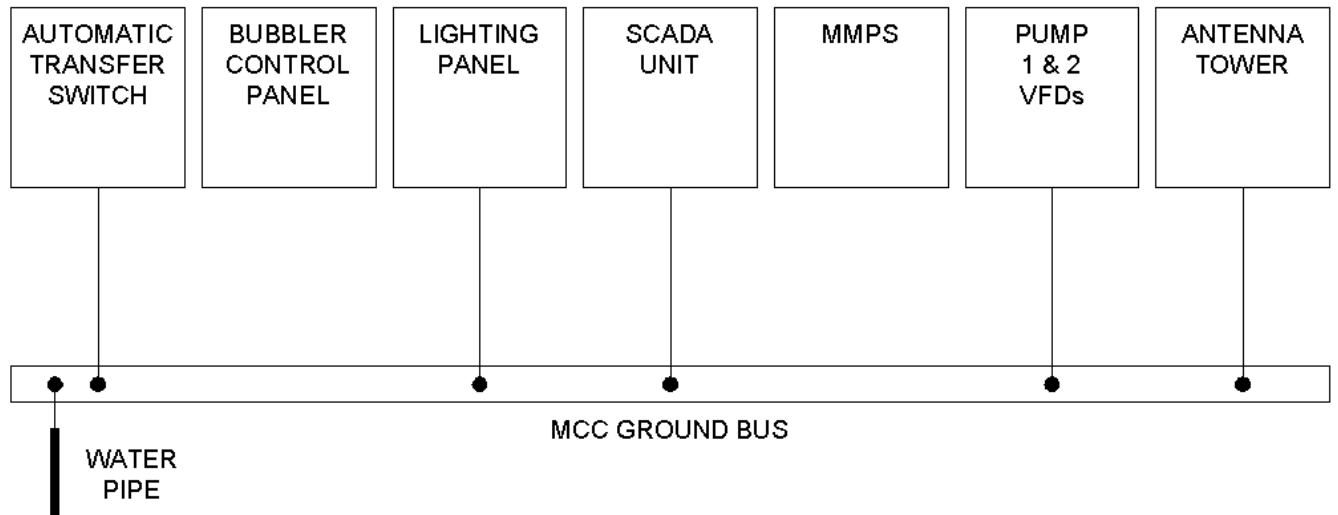


Figure 221-3. Patrick Henry Grounding System

### Patrick Henry Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment

- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 223 Washington St Pump Station

### Washington St Facility Description



Figure 223-1. Washington St Pump Station Location Map



Figure 223-2. Washington St Pump Station

<b>Table 223-1. Washington St PS</b>	
Pumping Facility Number	223
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/17/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1947
Address	217 Washington St, Hampton
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	20 ft.
Firm Pumping Capacity (GPM)	3000 GPM
Total Pumping Capacity (GPM)	6000 GPM
Number of Pumps	2
Pump Type	Centrifugal
Pump Manufacturer	Chicago
Pump Nameplate Capacity	3000 GPM
Standby Pump(s) present during inspection	6" Godwin CD150M
Motor Manufacturer	General Electric
Motor Nameplate Power (HP)	25
Generator Power (KW)	75

### Washington St Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 223-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
223	Washington Street	Building	Building	2	1	Good	No Immediate Action Required	Roof over the wet well was rehabilitated in 2002. 6" Godwin onsite (CD 150) as standby.	1
223	Washington Street	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak.	1
223	Washington Street	Wet well	Wet well	2	1	Good	No Immediate Action Required	Wet well was rehabilitated in 2007. There is some deterioration of the brickwork and lintel above the doorway at the upper deck.	1
223	Washington Street	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
223	Washington Street	Motor 1	Motor and Controller	1	1	Good	No Immediate Action Required	Strobe=452 rpm, digital=457 rpm	1
223	Washington Street	Motor 2	Motor and Controller	1	1	Good	No Immediate Action Required	Strobe=528 rpm, digital=524 rpm	1
223	Washington Street	Pump 1	Pump	3	1	Good	Continue Scheduled Maintenance Activities	Sprays water.	2
223	Washington Street	Pump 2	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	The shaft deflects visibly in operation. Shaft makes noise. Sprays water.	2
223	Washington Street	Pump 3	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
223	Washington Street	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	10/ 11: HRSD inspections indicate no issues with isolation valve operation	1
223	Washington Street	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
223	Washington Street	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

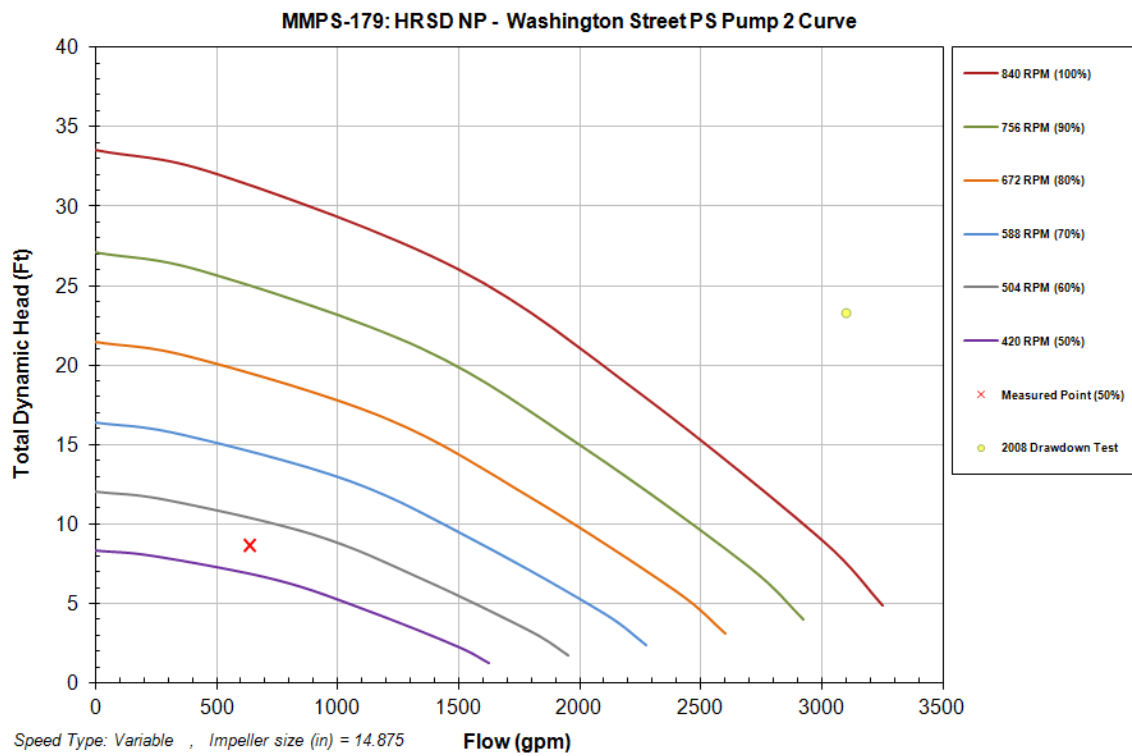
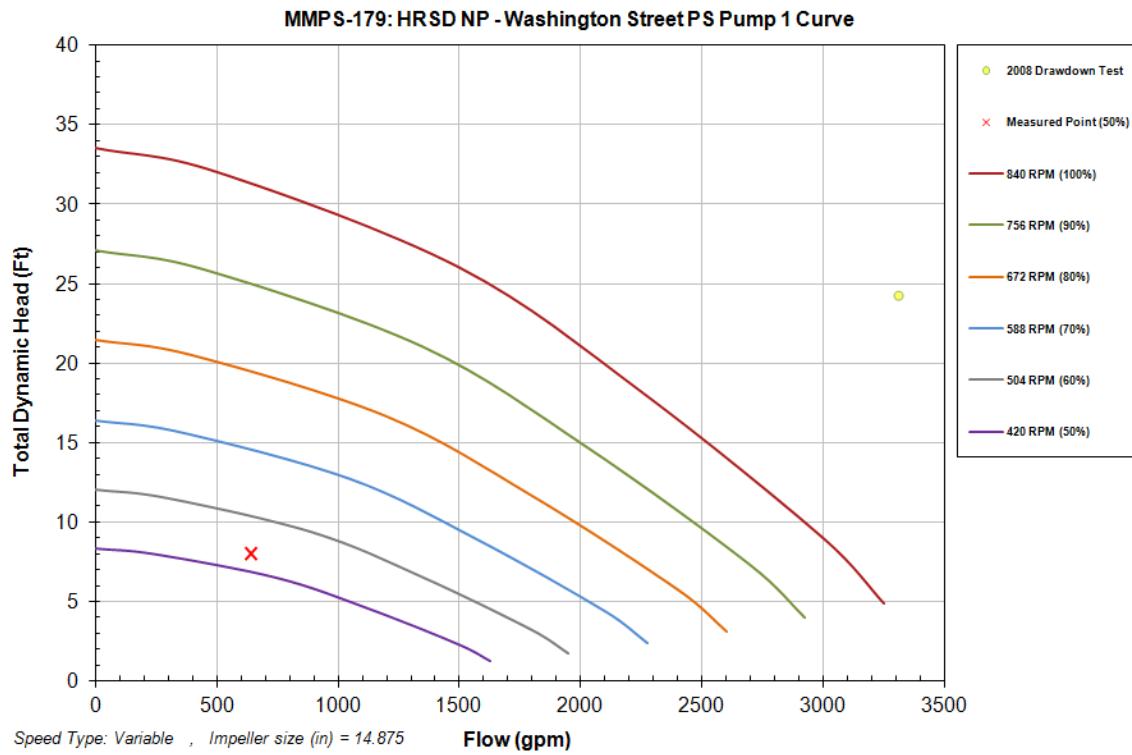
**Table 223-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
223	Washington Street	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
223	Washington Street	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
223	Washington Street	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
223	Washington Street	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
223	Washington Street	Electrical Equipment	Electrical Equipment	3	1	Good	Continue Scheduled Maintenance Activities	Utility pole supplying power to station is leaning. Temporary measures in place to prevent failure.	2
223	Washington Street	Instrumentation System	Instrumentation System	2	1	None to Report	No Immediate Action Required	Fluidtron analog gauge/control	1
223	Washington Street	Bubbler Panel	Bubbler Panel	1	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
223	Washington Street	VFD	VFD	2	1	None to Report	No Immediate Action Required	No Comment	1
223	Washington Street	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
223	Washington Street	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
223	Washington Street	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled. Uncapped wires loose in the panel.	No Immediate Action Required	No Comment	1
223	Washington Street	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No panel door grounding wire.	1

**Table 223-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
223	Washington Street	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
223	Washington Street	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
223	Washington Street	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Battery - Americad, HEF-53. Contacts are not properly protected.	1
223	Washington Street	Tank 1	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Washington St Assets of Interest

None.

### Washington St Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment properly Grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system.

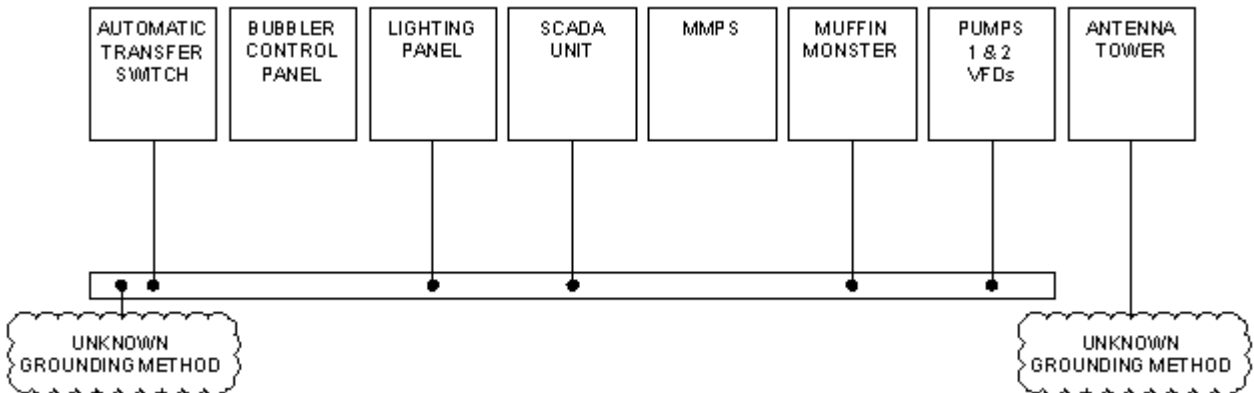


Figure 223-3. Washington St Grounding System

### Washington St Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate

- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 224 Woodland Rd Pump Station

### Woodland Rd Facility Description



Figure 224-1. Woodland Rd Pump Station Location Map



Figure 224-2. Woodland Rd Pump Station

<b>Table 224-1. Woodland Rd PS</b>	
Pumping Facility Number	224
Date of Initial Inspection	6/25/2008
Date of Update Inspection	6/27/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1960
Address	11 McElheney Lane, Hampton
Receiving Facility	York River Treatment Plant
Design Head (Feet)	30 ft., 28 ft.
Firm Pumping Capacity (GPM)	3600 GPM
Total Pumping Capacity (GPM)	5575 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1800 GPM, 1800 GPM, 1975 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	General Electric (2), U.S. Motors (1)
Motor Nameplate Power (HP)	20, 20, 25
Generator Power (KW)	100

### Woodland Rd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 224-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
224	Woodland Road	Building	Building	2	1	Good	No Immediate Action Required	Relatively new meter vault - no sump pump yet. 1" of water standing.	1
224	Woodland Road	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Wet well	Wet well	1	1	Good	No Immediate Action Required	Wet well was rehabbed in 2005. Flat roof replaced. 7/2011: HRSD PM inspection on 4/28/2011 indicates no major changes from the 2008 wet well data.	1
224	Woodland Road	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
224	Woodland Road	Motor 1	Electrical Pump Motor and Controller	2	1	Good Makes Noise	No Immediate Action Required	Faint noise which could be bearings.	1
224	Woodland Road	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Motor 3	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Pump 1	Pump	3	3	Shaft Deflection	Continue Scheduled Maintenance Activities	Nameplate not legible. Flow meter: 1600 gpm, 2.2 fps. Static pressure 3.2 psi. Upstream conditions prevent running with optimum suction head. Air bleed lines open all the time for each pump.	2
224	Woodland Road	Pump 2	Pump	3	3	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Nameplate not legible. Stuffing box slings water. Pump is noisier than other two. Vibration slight. Flow meter: 1950 gpm, 2.9 fps. Upstream conditions prevent running with optimum suction head -Air bleed lines open all the time for each pump.	2

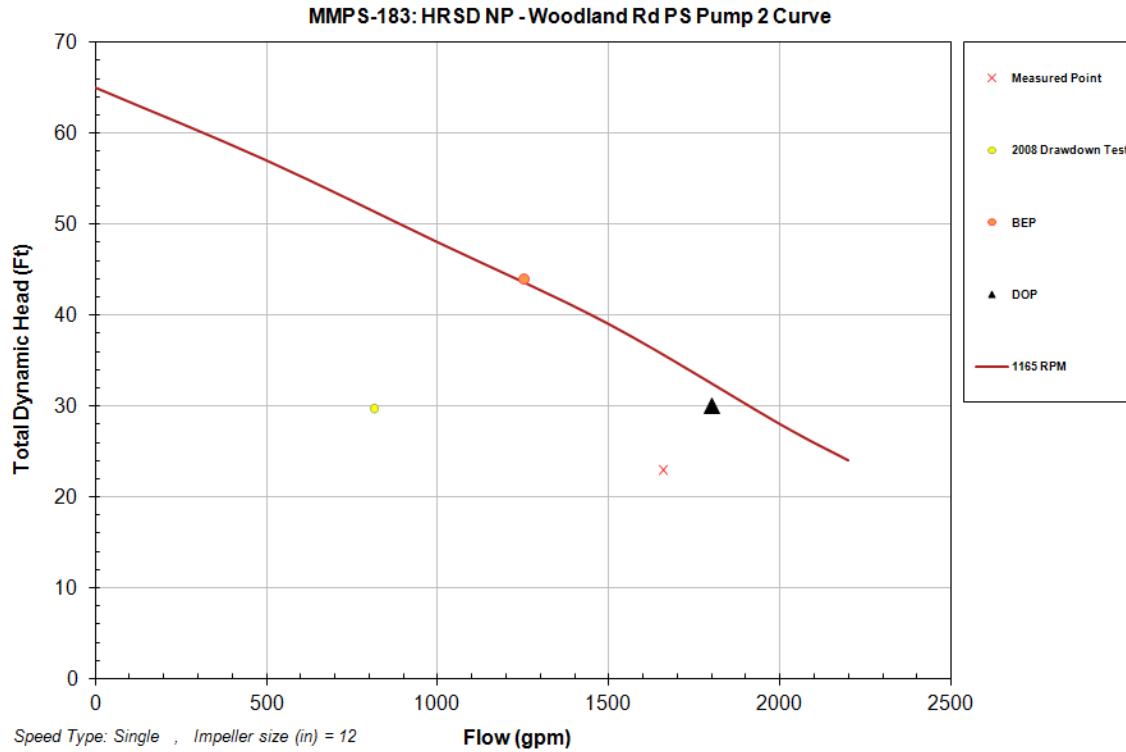
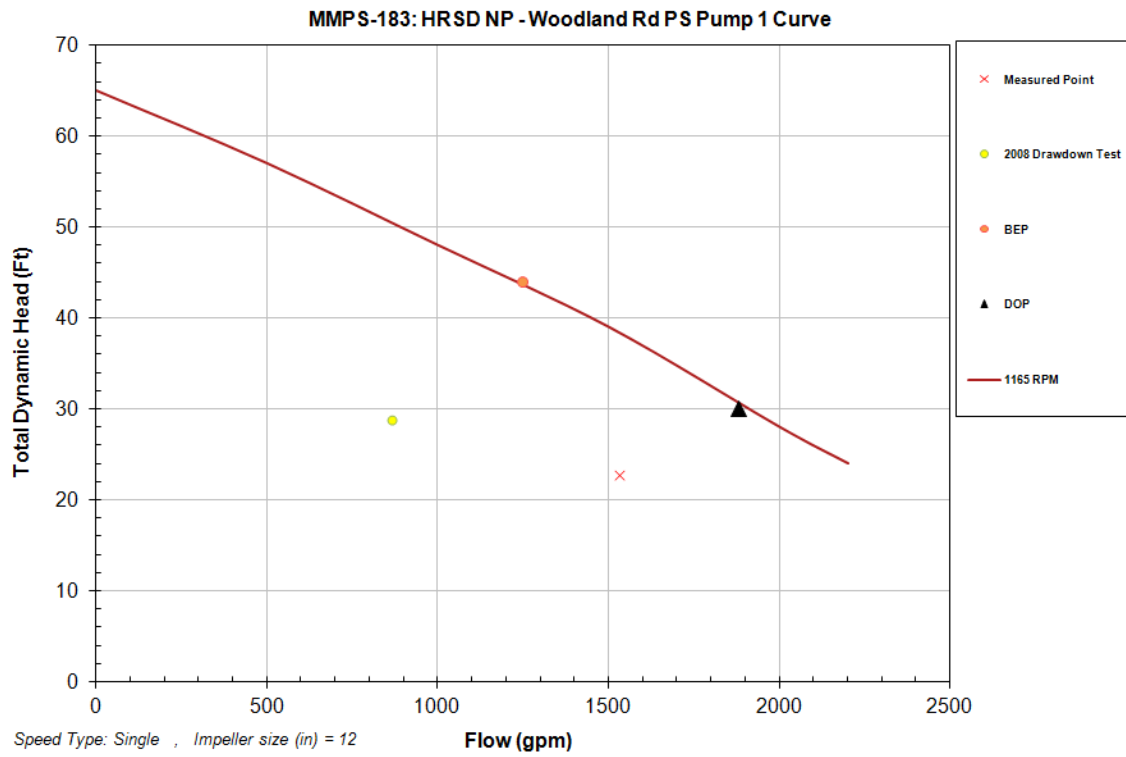
**Table 224-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
224	Woodland Road	Pump 3	Pump	3	3	Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Nameplate not legible. Slight vibration. Flow meter: 1600 gpm, 2.4 fps Flow meter all 3 pumps running: 3300 gpm, 5.0 fps Upstream conditions prevent running with optimum suction head - Air bleed lines open all the time for each pump	2
224	Woodland Road	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Discharge valves are relatively new plug valves. Check valve #3 has a loose spring. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
224	Woodland Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

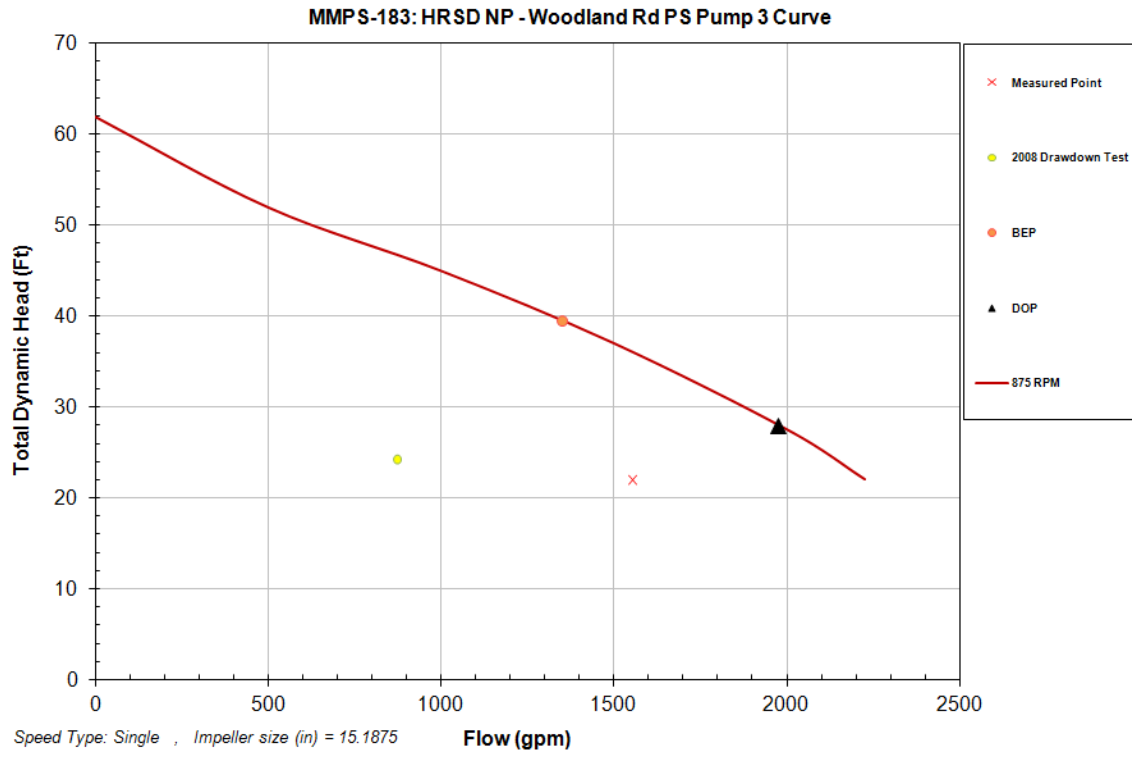
**Table 224-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
224	Woodland Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
224	Woodland Road	Electrical Equipment	Electrical Equipment	2	2	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Bubbler Panel	Bubbler Panel	3	2	No panel door grounding wire is installed.	Continue Scheduled Maintenance Activities	Evidence of a fire inside of the panel.	2
224	Woodland Road	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
224	Woodland Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
224	Woodland Road	SCADA	SCADA	2	1	No Panel Door Grounding Wire	No Immediate Action Required	Terminals not labeled.	1
224	Woodland Road	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	Install panel door ground wire	1
224	Woodland Road	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Generator	Generator	2	1	Good	No Immediate Action Required	Newage Caterpillar	1
224	Woodland Road	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
224	Woodland Road	Tank 1	Fuel Tank	3	1	Corrosion	Continue Scheduled Maintenance Activities	None.	2
224	Woodland Road	Tank 2	Fuel Tank	3	1	Corrosion	Continue Scheduled Maintenance Activities	None.	2

### Draw-Down Testing







### Woodland Rd Assets of Interest

None.

### Woodland Rd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment properly Grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system.

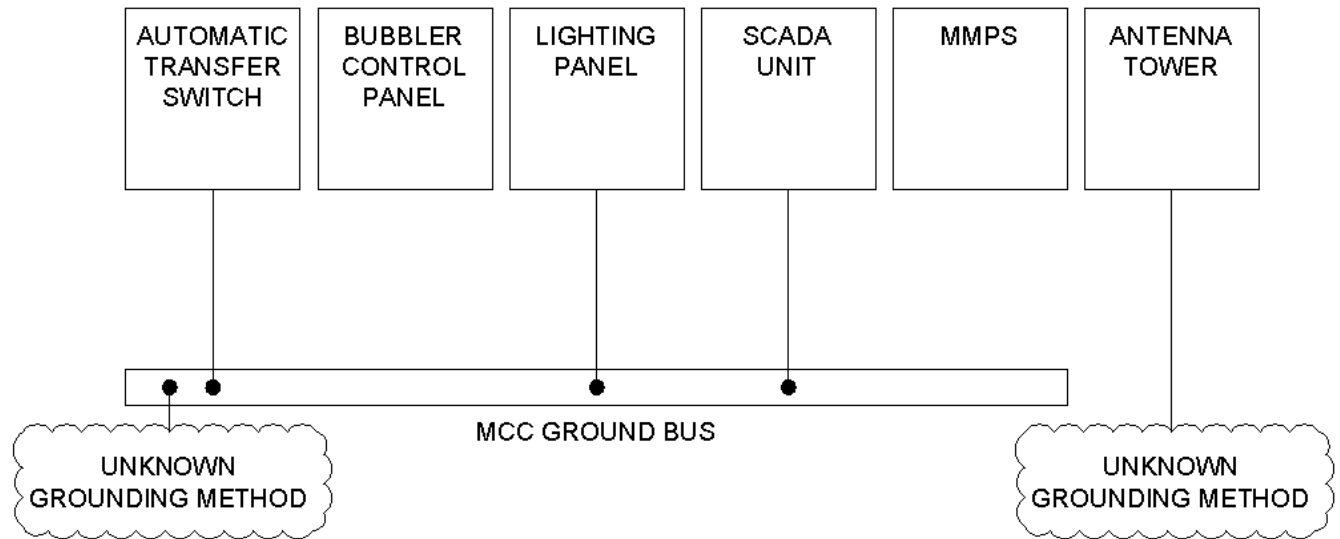


Figure 224-3. Woodland Rd Grounding System

### Woodland Rd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)

- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 225 Willard Ave Pump Station

### Willard Ave Facility Description



Figure 225-1. Willard Ave Pump Station Location Map



Figure 225-2. Willard Ave Pump Station

<b>Table 225-1. Willard Ave PS</b>	
Pumping Facility Number	225
Date of Initial Inspection	6/26/2008
Date of Update Inspection	6/27/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/3/2011
Date of Construction	1946
Address	219 National Ave, Hampton
Receiving Facility	Boat Harbor Treatment Plant
Design Head (Feet)	30 ft., 14 ft., 16 ft.
Firm Pumping Capacity (GPM)	5750 GPM
Total Pumping Capacity (GPM)	9250 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse (2), Chicago (1)
Pump Nameplate Capacity	2250 GPM, 3500 GPM, 3500 GPM 12" Godwin CD300M
Standby Pump(s) present during inspection	
Motor Manufacturer	Marathon Electric
Motor Nameplate Power (HP)	30
Generator Power (KW)	120

### Willard Ave Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 225-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
225	Willard Ave	Building	Building	2	1	Good	No Immediate Action Required	Roof shingles damaged. 12" Godwin onsite.	1
225	Willard Ave	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Wet well	Wet well	3	1	Concrete Spalling	Continue Scheduled Maintenance Activities	7/2011: HRSD PM inspection on 7/27/2011 indicates no major changes from the 2008 wet well data.	2
225	Willard Ave	Influent Valve	Influent Valve	2	2	None to Report	No Immediate Action Required	Tight in operation. Valve is functional.	1
225	Willard Ave	Motor 1	Motor and Controller	2	1	Good Higher than Expected Operating Temperature	No Immediate Action Required	Strobe = 980rpm, digital=992rpm. #1 pump stays in lead - 854 rpm upon arrival. Motor felt warm.	1
225	Willard Ave	Motor 2	Motor and Controller	2	1	Good	No Immediate Action Required	Strobe = 980rpm, digital=992rpm.	1
225	Willard Ave	Motor 3	Motor and Controller	2	1	None to Report	No Immediate Action Required	Strobe = 657rpm, digital=667rpm.	1
225	Willard Ave	Motor	Odor Control Caustic Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Motor	Odor Control Blower Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Pump 1	Wastewater Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Pump is aging; made noise. The upper shaft is deflecting - more pronounced at lower speeds.	2

Table 225-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
225	Willard Ave	Pump 2	Wastewater Pump	2	2	Good Shaft Deflection	No Immediate Action Required	Pump is aging. Nameplate not legible. Open vane impeller. Slight deflection in upper shaft; shaft not exactly vertical. Pump made noises	1
225	Willard Ave	Pump 3	Wastewater Pump	2	2	Good Vibration	No Immediate Action Required	Nameplate illegible. Shaft made rattling noise. Shaft not exactly vertical.	1
225	Willard Ave	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Pump	Chemical Feed Pump	1	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Pump	Recirculation Pump	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Valves System	All Station Valves	2	2	Good	No Immediate Action Required	7/11: HRSD inspections indicate that #1 discharge does not hold. HRSD still able to perform preventive maintenance on pump.	1
225	Willard Ave	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
225	Willard Ave	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
225	Willard Ave	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
225	Willard Ave	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
225	Willard Ave	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
225	Willard Ave	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

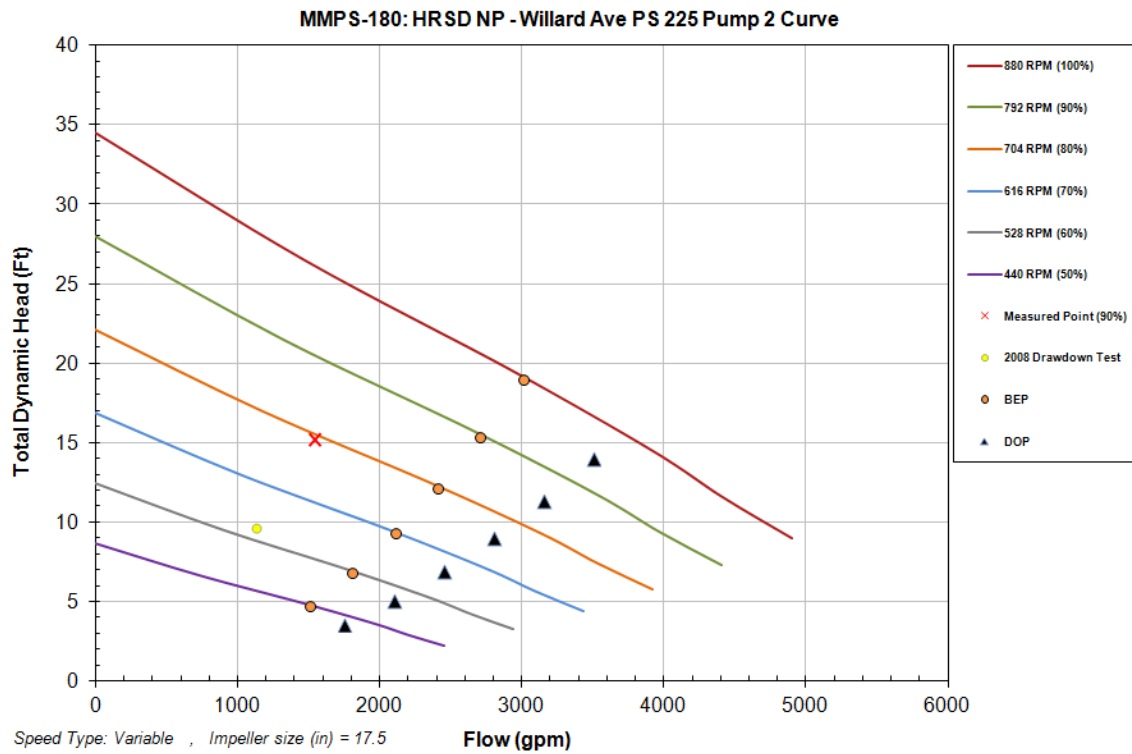
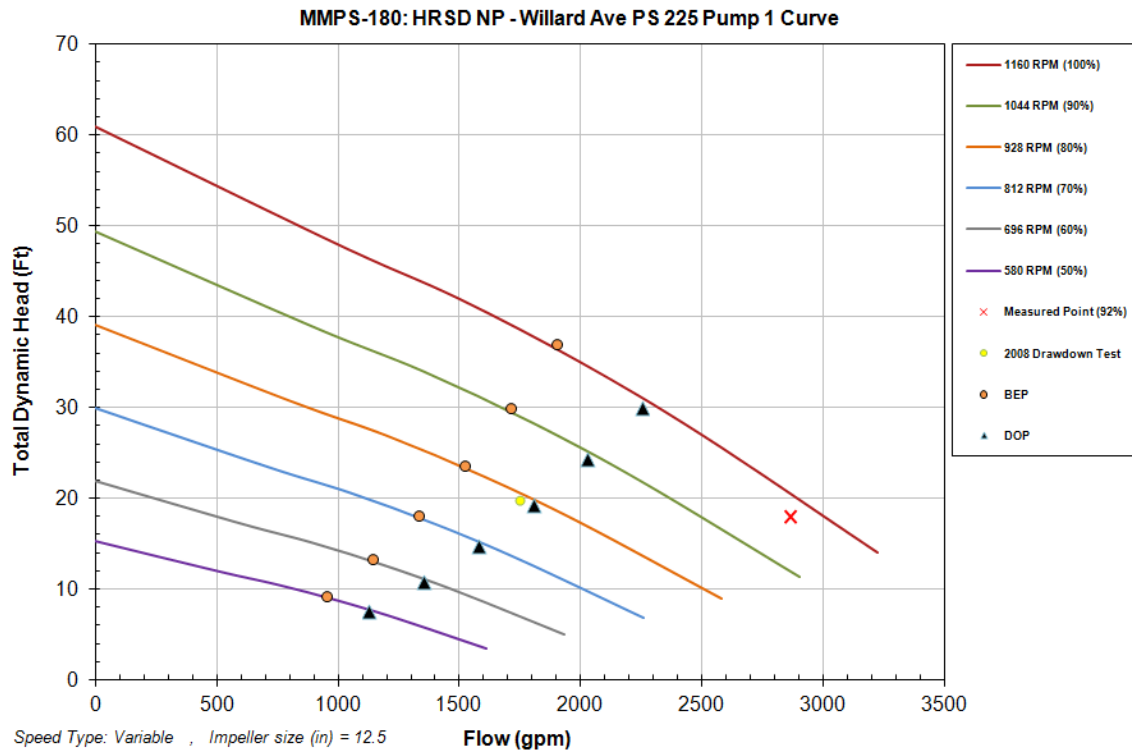


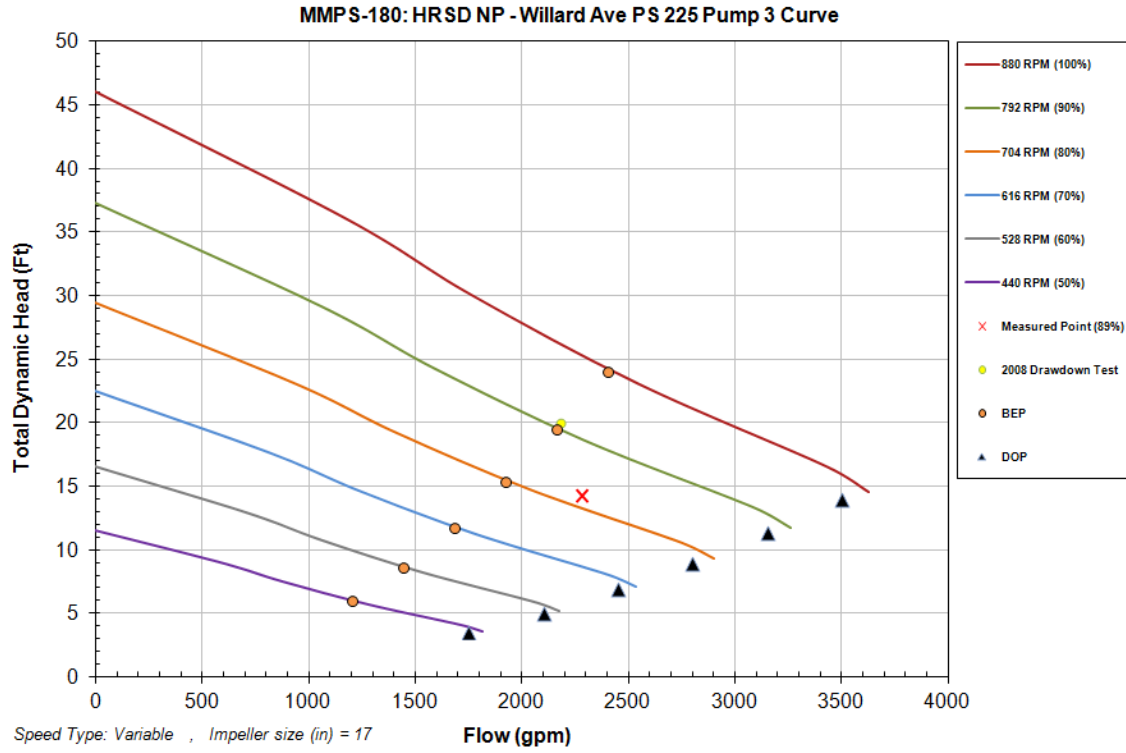
Table 225-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
225	Willard Ave	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	4	See Valves System Field Observations	Corrective Action Required	See Valves System Comments.	4
225	Willard Ave	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
225	Willard Ave	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
225	Willard Ave	Electrical Equipment	Electrical Equipment	2	1	Good Panel Obsolete	No Immediate Action Required	Rehabbed in 1980's. Uncapped wires hanging on the wall.	1
225	Willard Ave	Instrumentation System	Instrumentation System	3	2	None to Report	Continue Scheduled Maintenance Activities	Fluidtron analog gauge/control	2
225	Willard Ave	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
225	Willard Ave	VFD	VFD	2	1	None to Report	No Immediate Action Required	No Comment	1
225	Willard Ave	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
225	Willard Ave	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
225	Willard Ave	SCADA	SCADA	2	1	No panel door grounding wire	No Immediate Action Required	No Comment	1
225	Willard Ave	Velocity Profiler	Velocity Profiler	1	1	None to Report	No Immediate Action Required	No Comment	1
225	Willard Ave	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
225	Willard Ave	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Ni-Cad battery. Battery contacts are not properly covered.	1

Table 225-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
225	Willard Ave	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Tank 2	Scrubber Tank	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Tank 3	Chemical Tank	2	1	Good	No Immediate Action Required	No Comment	1
225	Willard Ave	Tank 4	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Willard Ave Assets of Interest

None.

### Willard Ave Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel, scrubber room control panel, & velocity profiler are not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS & bubbler control panel are not bonded to the station grounding system

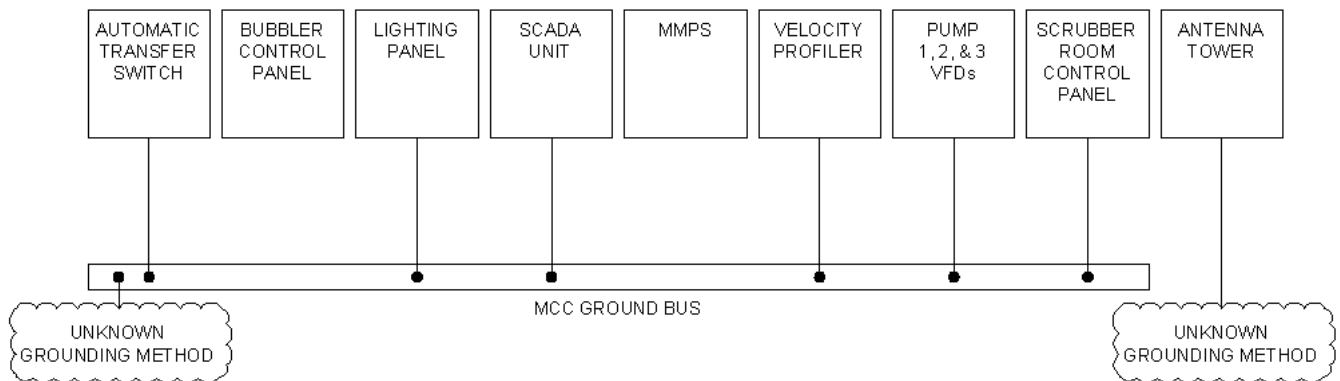


Figure 225-3. Willard Ave Grounding System

### Willard Ave Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate

- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 226 Williamsburg Pump Station

### Williamsburg Facility Description



Figure 226-1. Williamsburg Pump Station Location Map



Figure 226-2. Williamsburg Pump Station

<b>Table 226-1. Williamsburg PS</b>	
Pumping Facility Number	226
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/13/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/2/2011
Date of Construction	1970
Address	540 South England Street, Williamsburg
Receiving Facility	Williamsburg Treatment Plant
Design Head (Feet)	88 ft.
Firm Pumping Capacity (GPM)	5600 GPM
Total Pumping Capacity (GPM)	8400 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Alliss Chalmers
Pump Nameplate Capacity	2800 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Siemens
Motor Nameplate Power (HP)	100
Generator Power (KW)	300

### Williamsburg Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.



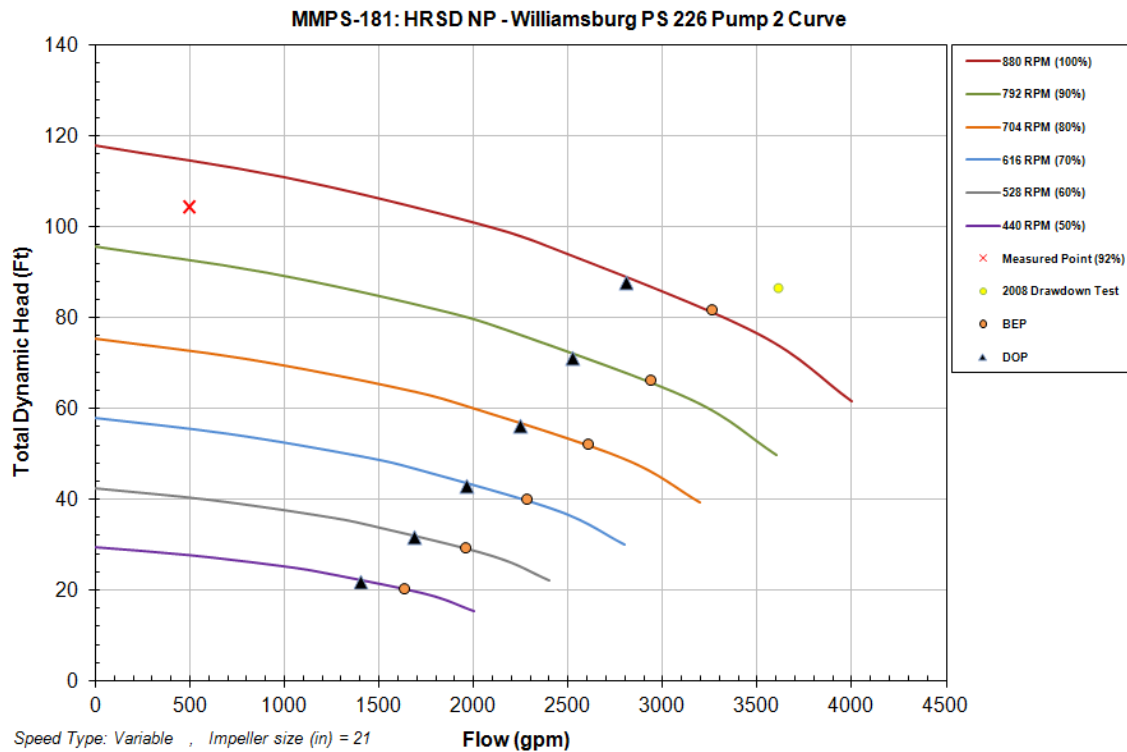
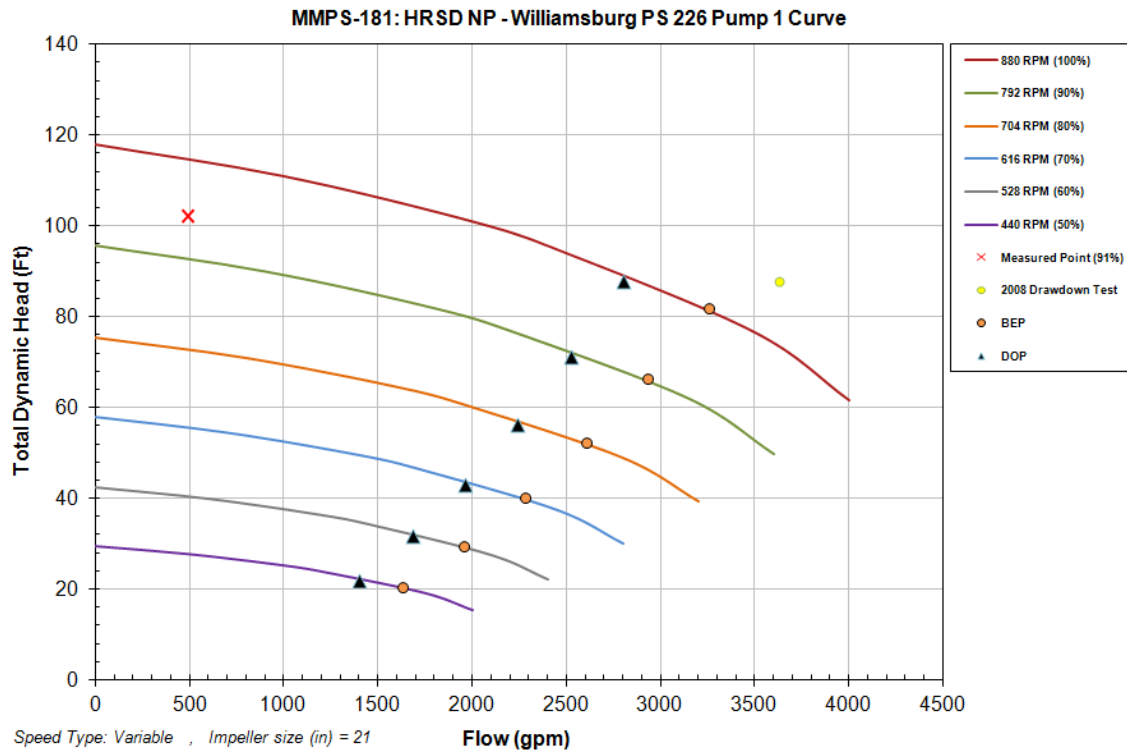
Table 226-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
226	Williamsburg	Building	Building	2	1	Good	No Immediate Action Required	Roof replaced in 2006. Fence is damaged in 2 places. Ground hogs have a history of digging under the foundation at this site. The crane rails are similar but one is labeled 5 tons and the other 2 tons. Crane rated at 2 tons.	1
226	Williamsburg	HVAC System	HVAC System	2	2	Good Low Detectable Airflow	No Immediate Action Required	Dry well ventilation is weak. There is a fan in an abandoned room that was not assessed.	1
226	Williamsburg	Wet well	Wet well	3	3	Concrete Spalling Concrete Corrosion	Continue Scheduled Maintenance Activities	Wet well spalled. 7/2011: HRSD PM inspection on 9/28/2010 indicates no major changes from the 2008 wet well data.	2
226	Williamsburg	Influent Valve	Influent Valve	5	5	None to Report	Replace/Refurbish	Rusted and not operable. HRSD able to isolate the wet well using other methods.	5
226	Williamsburg	Motor 1	Electrical Motor and Controller	2	2	Good	No Immediate Action Required	Motor doesn't seem to wind up or down smoothly.	1
226	Williamsburg	Motor 2	Electrical Motor and Controller	1	2	Good	No Immediate Action Required	Shaft has slight occasional rattle.	1
226	Williamsburg	Motor 3	Electrical Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
226	Williamsburg	Pump 1	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	The shaft deflection is causing the safety cage to rattle. Pumps not experiencing enough flow for the pumps to keep the check valves open during test.	2
226	Williamsburg	Pump 2	Pump	2	1	Good	No Immediate Action Required	Pumps not experiencing enough flow for the pumps to keep the check valves open during test.	1
226	Williamsburg	Pump 3	Pump	3	2	Shaft Deflection	Continue Scheduled Maintenance Activities	Pumps not experiencing enough flow for the pumps to keep the check valves open during test.	2
226	Williamsburg	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

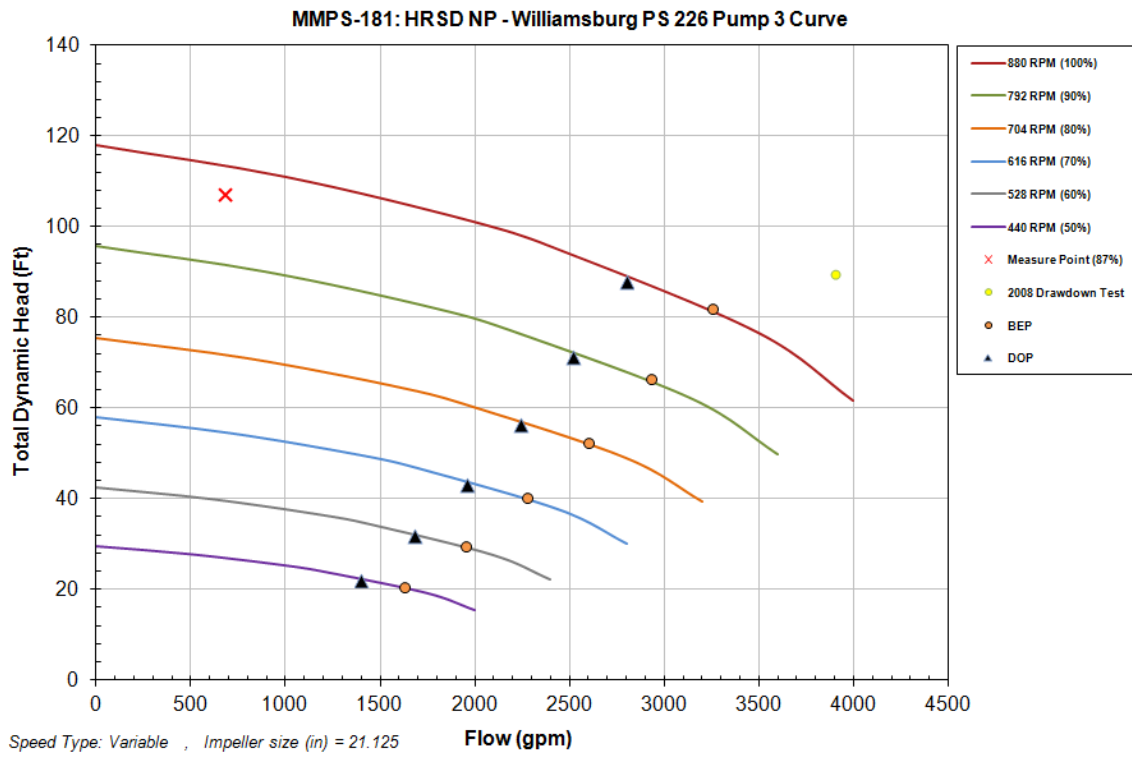
Table 226-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
226	Williamsburg	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valves open and close as pumps are running. Check valve springs are loose. Check valve #1 has a leak at the arm. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
226	Williamsburg	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Check Valve Pump 1	Check Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
226	Williamsburg	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
226	Williamsburg	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No Comment	1
226	Williamsburg	Instrumentation System	Instrumentation System	1	1	Good	No Immediate Action Required	No Comment	1

Table 226-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
226	Williamsburg	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
226	Williamsburg	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
226	Williamsburg	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
226	Williamsburg	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
226	Williamsburg	SCADA	SCADA	4	2	No panel door grounding wire. Panel is very corroded.	Schedule Corrective Action	No Comment	3
226	Williamsburg	Velocity Profiler	Velocity Profiler	1	1	Metal shavings in the bottom of the panel	No Immediate Action Required	No Comment	1
226	Williamsburg	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No panel door grounding wire.	1
226	Williamsburg	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No nameplate. Exhaust wrap may be asbestos.	1
226	Williamsburg	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
226	Williamsburg	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Battery contacts are properly protected.	1
226	Williamsburg	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
226	Williamsburg	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Williamsburg Assets of Interest

None.

### Williamsburg Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel & velocity profiler are not protected by a surge suppressor.
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system

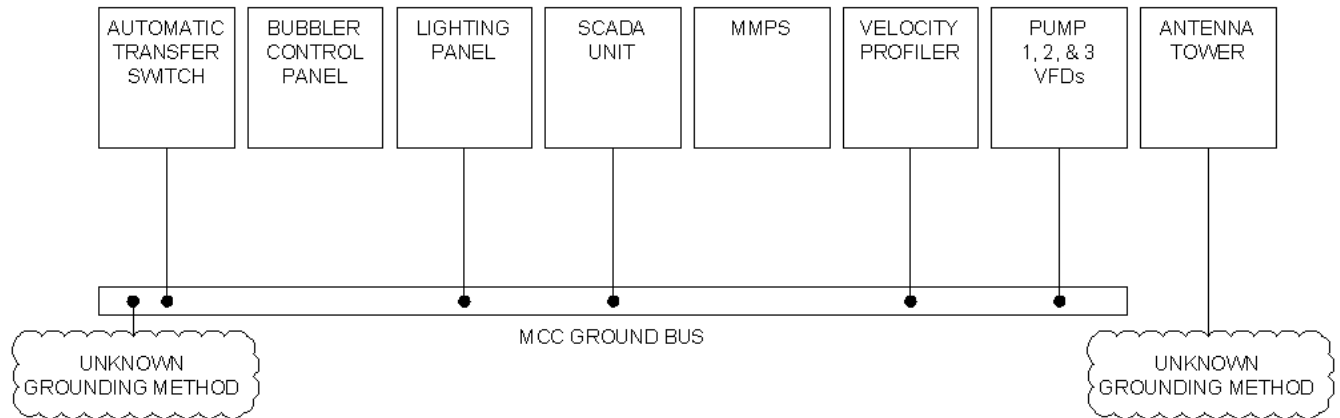


Figure 226-3. Williamsburg Grounding System

### Williamsburg Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate

- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 227 Fort Eustis Pump Station

### Fort Eustis Facility Description

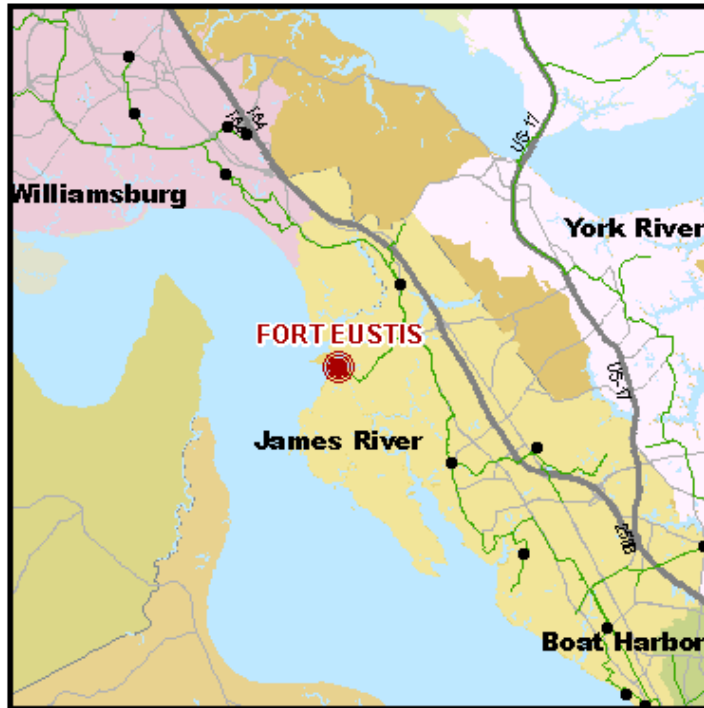


Figure 227-1. Fort Eustis Pump Station Location Map



Figure 227-2. Fort Eustis Pump Station

<b>Table 227-1. Fort Eustis PS</b>	
Pumping Facility Number	227
Date of Initial Inspection	7/2/2008
Date of Update Inspection	6/15/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/15/2011
Date of Construction	1998
Address	1619 Talor Ave, Newport News
Receiving Facility	Williamsburg Treatment Plant
Design Head (Feet)	85 ft. / 162 ft.
Firm Pumping Capacity (GPM)	2736 GPM / 1520 GPM
Total Pumping Capacity (GPM)	4104 GPM / 2280 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1368 GPM / 760 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	150
Generator Power (KW)	300

### Fort Eustis Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

**Table 227-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
227	Fort Eustis	Building	Building	2	1	Good	No Immediate Action Required	1.5 ton crane. Potable water backflow preventer is leaking.	1
227	Fort Eustis	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Motorized louver is disconnected and propped open.	1
227	Fort Eustis	Wet well	Wet well	2	2	Good	No Immediate Action Required	7/2011: HRSD PM inspection on 09/12/11 indicates a necessary repair to the intermediate deck grating. The repair was done on 09/28/11. Personnel report that air entrainment in influent channel causing operational issues.	1
227	Fort Eustis	Influent Valve	Influent Valve	3	3	None to Report	Continue Scheduled Maintenance Activities	Sluice gate is difficult to operate. Used valve trailer (hydraulic motor) to raise gate during PM.	2
227	Fort Eustis	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Motor 3	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Pump 1	Pump	2	1	Good	No Immediate Action Required	Ran from 900-1000 RPM in auto operation while onsite. The pump did not open the check valve appreciably during test. Piping is using flexible components.	1
227	Fort Eustis	Pump 2	Pump	2	1	Good	No Immediate Action Required	Ran from 900-1000 RPM in auto operation while onsite. Piping is using flexible components.	1
227	Fort Eustis	Pump 3	Pump	2	1	Good	No Immediate Action Required	Piping is using flexible components.	1

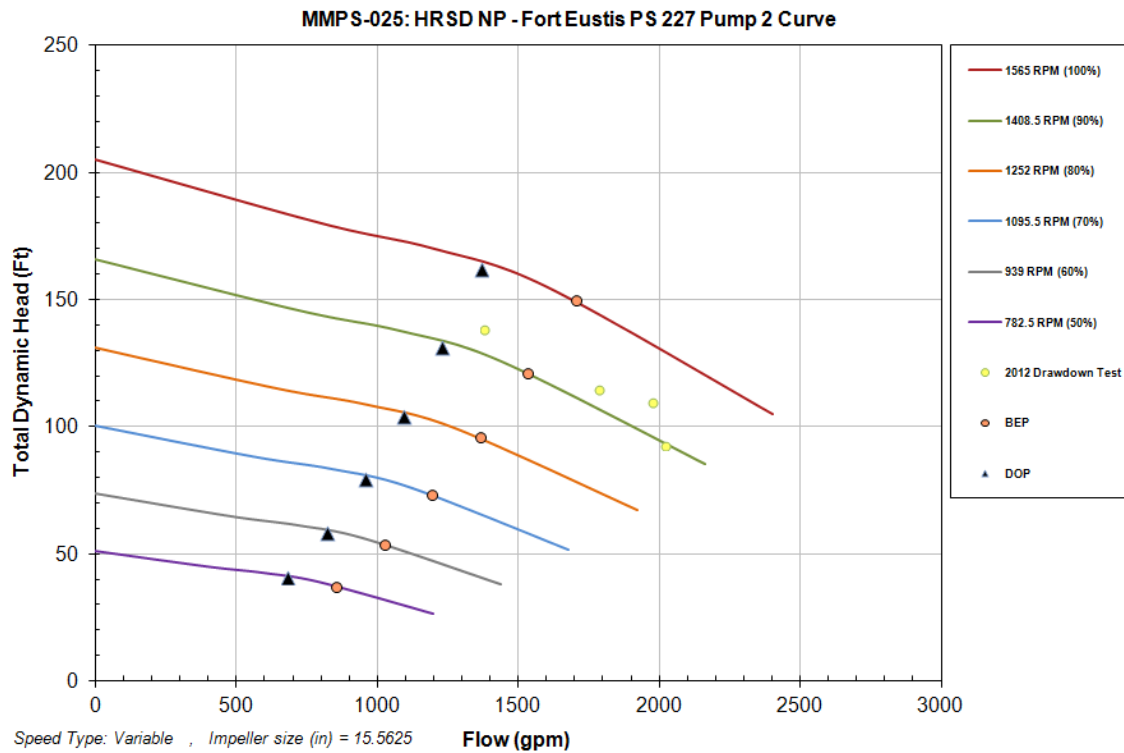
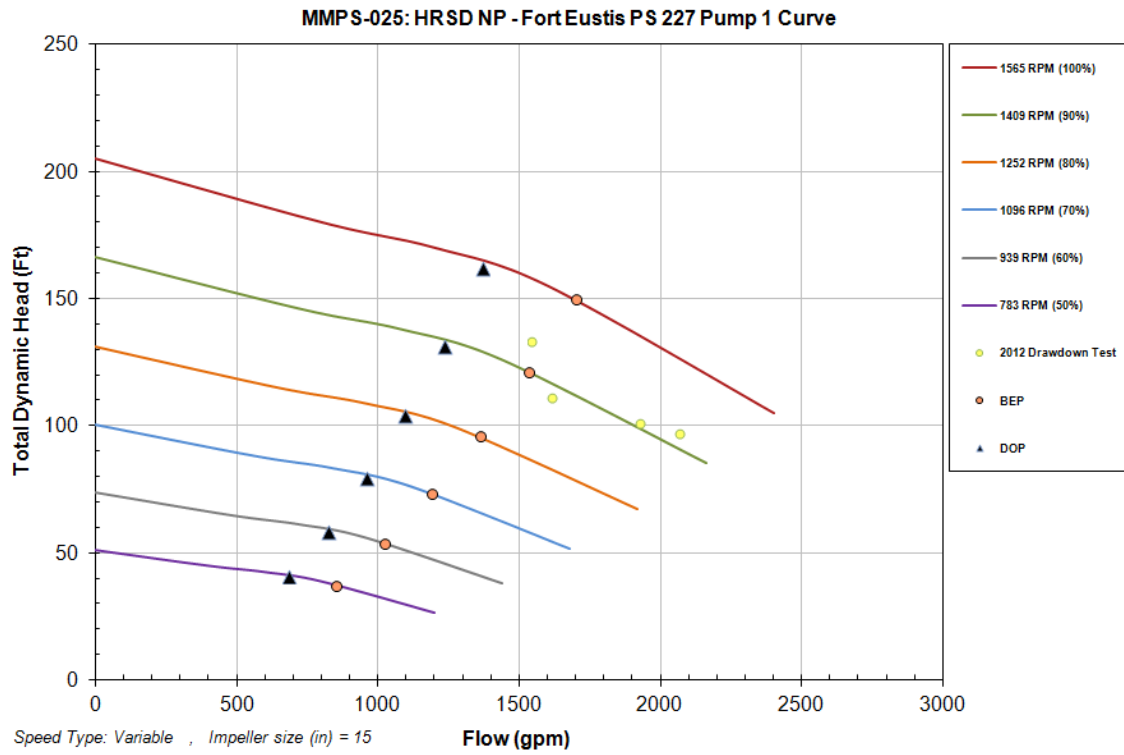
**Table 227-2. Pumping Facility Asset Condition and Performance Ratings**

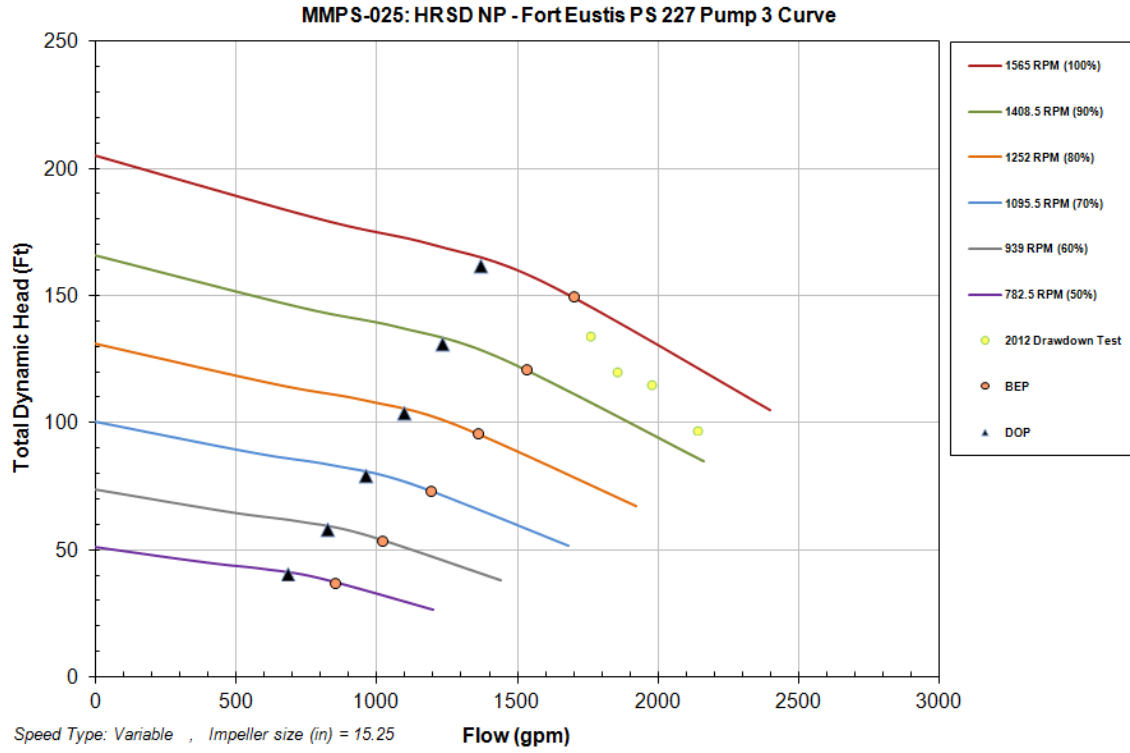
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
227	Fort Eustis	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Discharge isolation valve #2 is dripping. Check valve #3 arm is leaking. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
227	Fort Eustis	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
227	Fort Eustis	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
227	Fort Eustis	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
227	Fort Eustis	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
227	Fort Eustis	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
227	Fort Eustis	Check Valve Pump 3	Check Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
227	Fort Eustis	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
227	Fort Eustis	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
227	Fort Eustis	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 227-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
227	Fort Eustis	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
227	Fort Eustis	VFD	VFD	2	1	None to Report	No Immediate Action Required	No Comment	1
227	Fort Eustis	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
227	Fort Eustis	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
227	Fort Eustis	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled.	No Immediate Action Required	No Comment	1
227	Fort Eustis	Transfer Switch	Transfer Switch	2	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
227	Fort Eustis	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
227	Fort Eustis	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





HRSD performed physical draw down tests in 2012. A Telog-based Measured Point is not shown.

### Fort Eustis Assets of Interest

The influent channel configuration is causing operational issues.



Figure 227-3. Ft. Eustis Influent Channel.

### Fort Eustis Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system



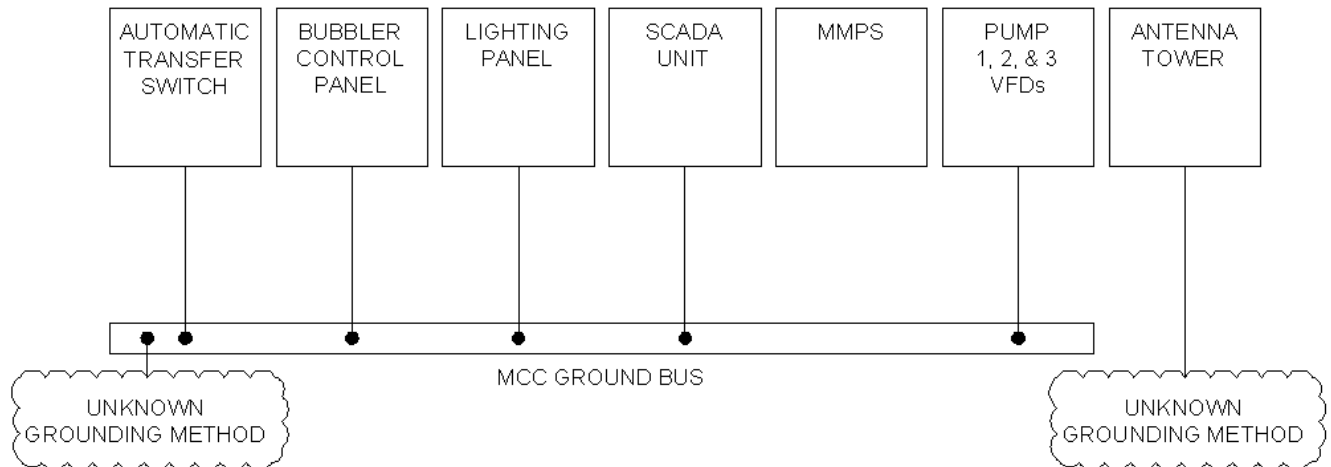


Figure 227-4. Fort Eustis Grounding System

### Fort Eustis Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 229 Colonial Williamsburg Pump Station

### Colonial Williamsburg Facility Description

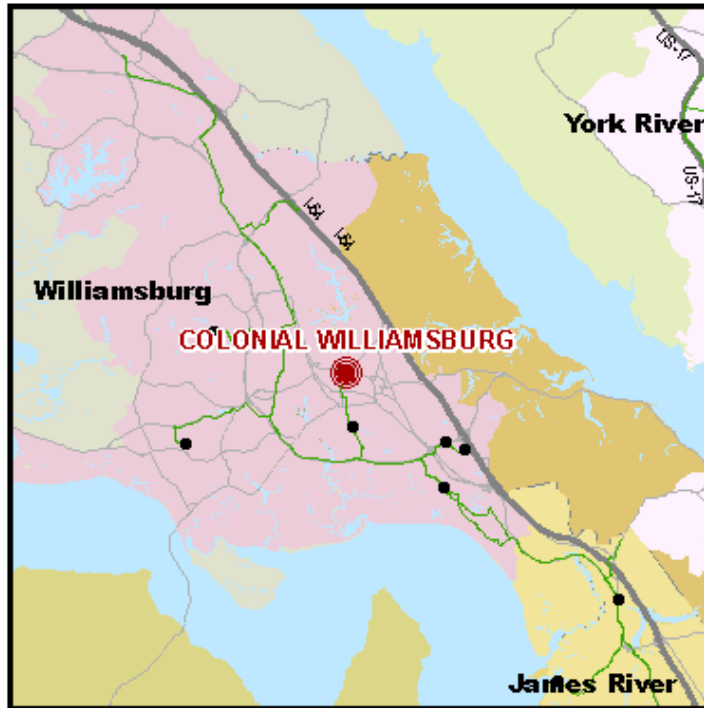


Figure 229-1. Colonial Williamsburg Pump Station Location Map



Figure 229-2. Colonial Williamsburg Pump Station

<b>Table 229-1. Colonial Williamsburg PS</b>	
Pumping Facility Number	229
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/13/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/2/2011
Date of Construction	2005
Address	1000 State Route 132, York Co
Receiving Facility	Williamsburg Treatment Plant
Design Head (Feet)	163 ft. / 120 ft.
Firm Pumping Capacity (GPM)	2800 GPM / 4500 GPM
Total Pumping Capacity (GPM)	4200 GPM / 6750 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	1400 GPM / 2250 GPM
Standby Pump(s) present during inspection	12" Godwin CD300M - Removed
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	118
Generator Power (KW)	355

### Colonial Williamsburg Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 229-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
229	Colonial Williamsburg	Building	Building	1	1	Good	No Immediate Action Required	Godwin pump onsite because #2 pump has been removed for seal repairs.	1
229	Colonial Williamsburg	HVAC System	HVAC System	1	1	Good	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Wet well	Wet well	1	1	Good	No Immediate Action Required	8/2011: HRSD PM inspection on 8/31/2011 indicates no major changes from the 2008 wet well data.	1
229	Colonial Williamsburg	Influent Valve	Influent Valve	1	2	None to Report	No Immediate Action Required	Smooth operation. Did not seat 100%	1
229	Colonial Williamsburg	Motor 1	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	Cooling jackets are not used.	1
229	Colonial Williamsburg	Motor 2	Electrical Motor and Controller	1	See Comments	Good	Continue Scheduled Maintenance Activities	Pump was removed during inspection for seal repair. Condition not verified from 2008, performance not assessed.	2
229	Colonial Williamsburg	Motor 3	Electrical Motor and Controller	2	1	Good	No Immediate Action Required	Cooling jackets are not used.	1
229	Colonial Williamsburg	Pump 1	Pump	2	2	Good Cavitating	No Immediate Action Required	Pump had noise of cavitation which became faint after OPS bled off the air. Low flow conditions most likely causing cavitation.	1
229	Colonial Williamsburg	Pump 2	Pump	1	See Comments	Good	Continue Scheduled Maintenance Activities	Pump was removed during inspection for seal repair. Condition not verified, performance not assessed.	2
229	Colonial Williamsburg	Pump 3	Pump	2	2	Good Cavitating	No Immediate Action Required	Cavitation did not seem severe - most likely caused by low flow conditions.	1

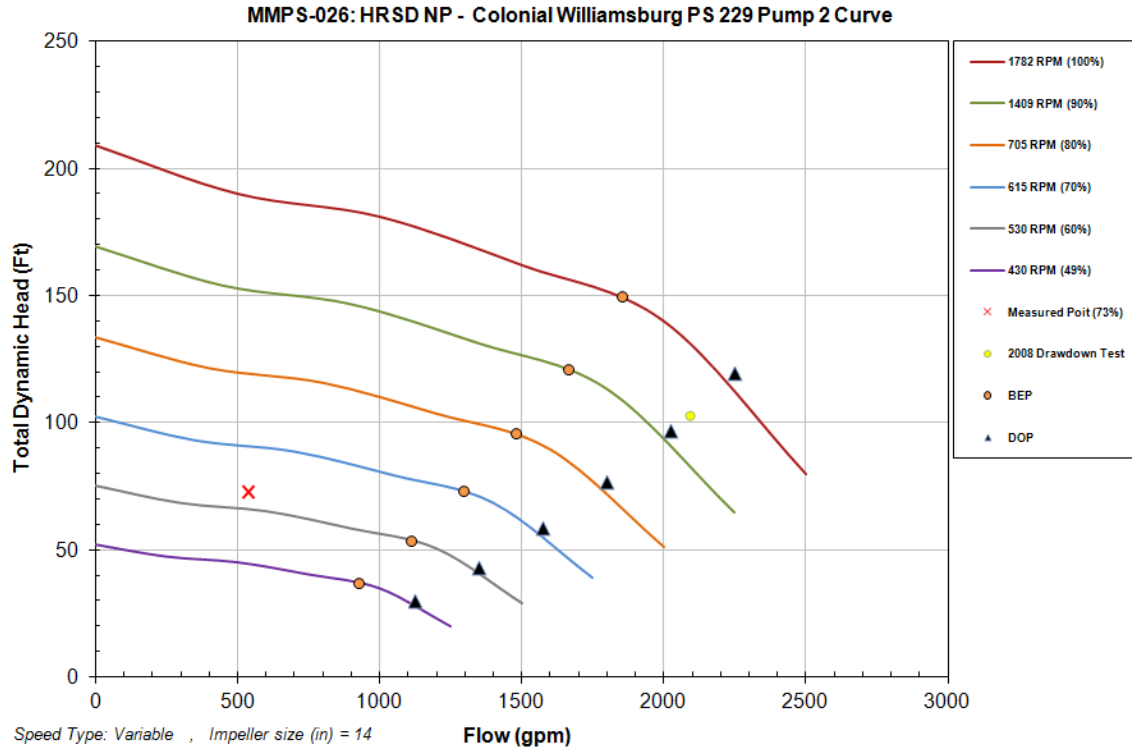
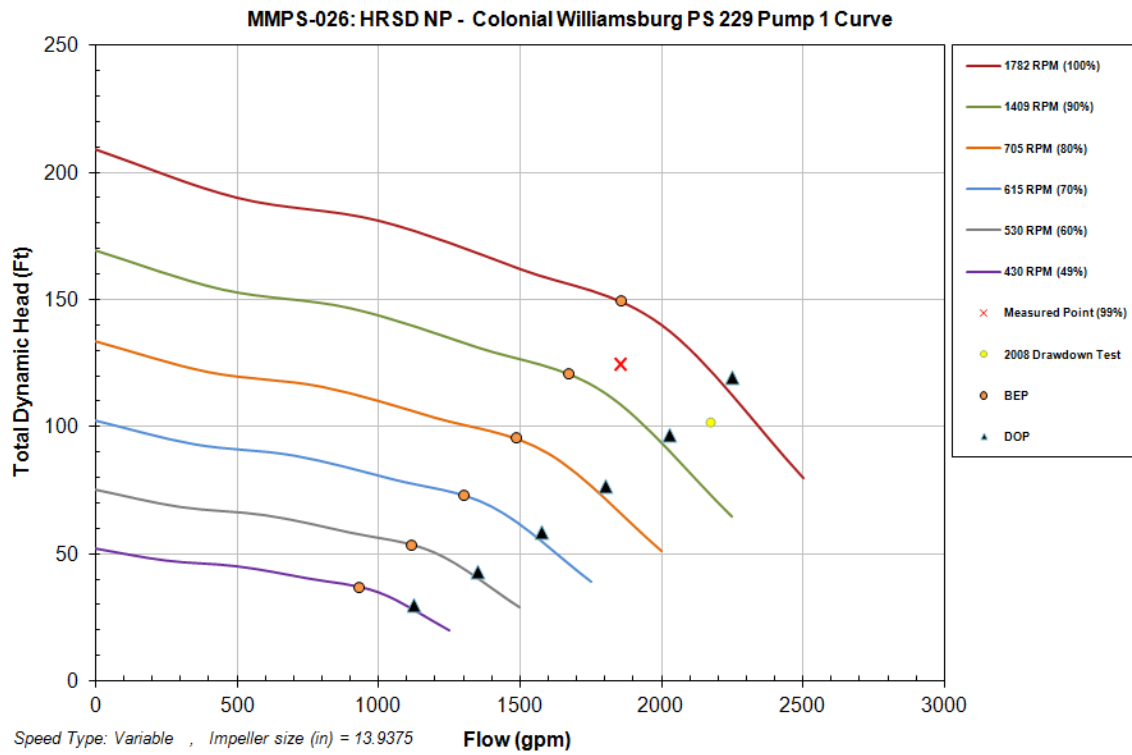
**Table 229-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
229	Colonial Williamsburg	Pump	Sump Pump	2	2	Good	No Immediate Action Required	Discharge piping leaks.	1
229	Colonial Williamsburg	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Surge relief valve is installed. #3 discharge valve is dripping and #2 discharge valve is wet. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
229	Colonial Williamsburg	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
229	Colonial Williamsburg	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
229	Colonial Williamsburg	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
229	Colonial Williamsburg	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
229	Colonial Williamsburg	Check Valve Pump 2	Check Valve	2	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
229	Colonial Williamsburg	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
229	Colonial Williamsburg	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
229	Colonial Williamsburg	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
229	Colonial Williamsburg	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	3	1	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
229	Colonial Williamsburg	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No panel door ground wire on VFDs.	1

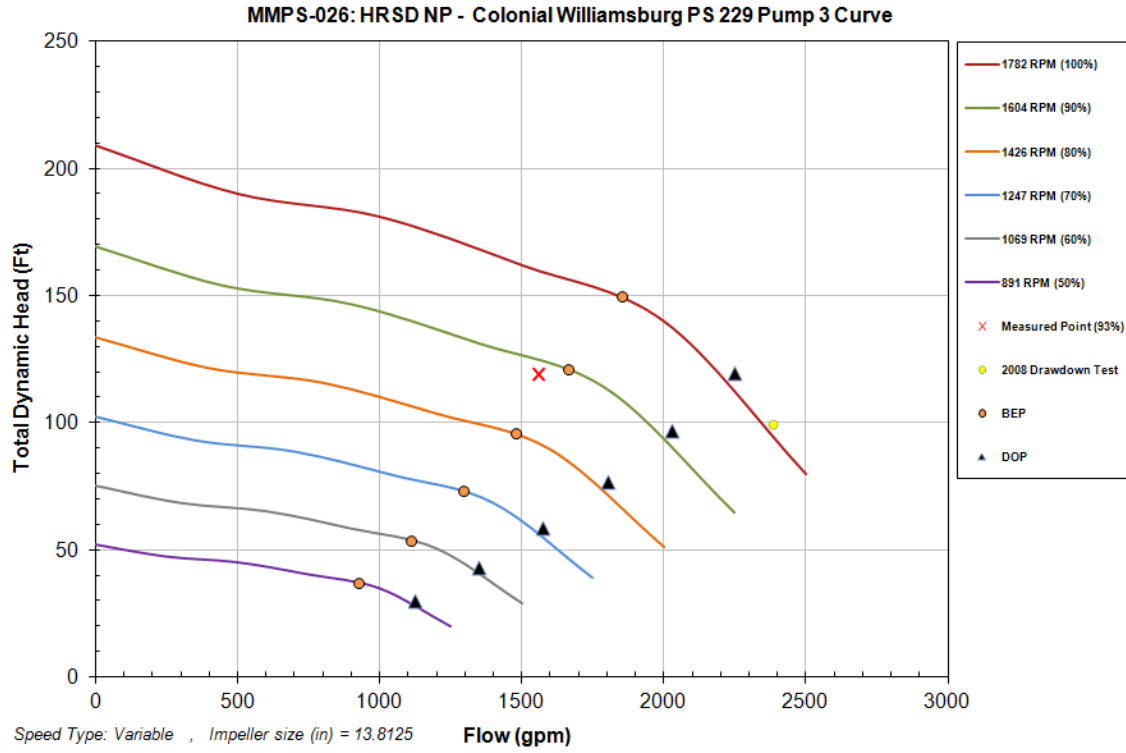
Table 229-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
229	Colonial Williamsburg	Instrumentation System	Instrumentation System	1	1	Good	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Compressor	Compressor	1	1	None to Report	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	SCADA	SCADA	1	1	Located in bubbler control panel	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Transfer Switch	Transfer Switch	1	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Engine	Generator Drive Engine	3	1	Excessive/Dark Exhaust	Continue Scheduled Maintenance Activities	Fuel leak at elbow fitting below the vent duct.	2
229	Colonial Williamsburg	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Tank 1	Fuel Day Tank	1	1	Good	No Immediate Action Required	No Comment	1
229	Colonial Williamsburg	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing







### Colonial Williamsburg Assets of Interest

None.

### Colonial Williamsburg Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system

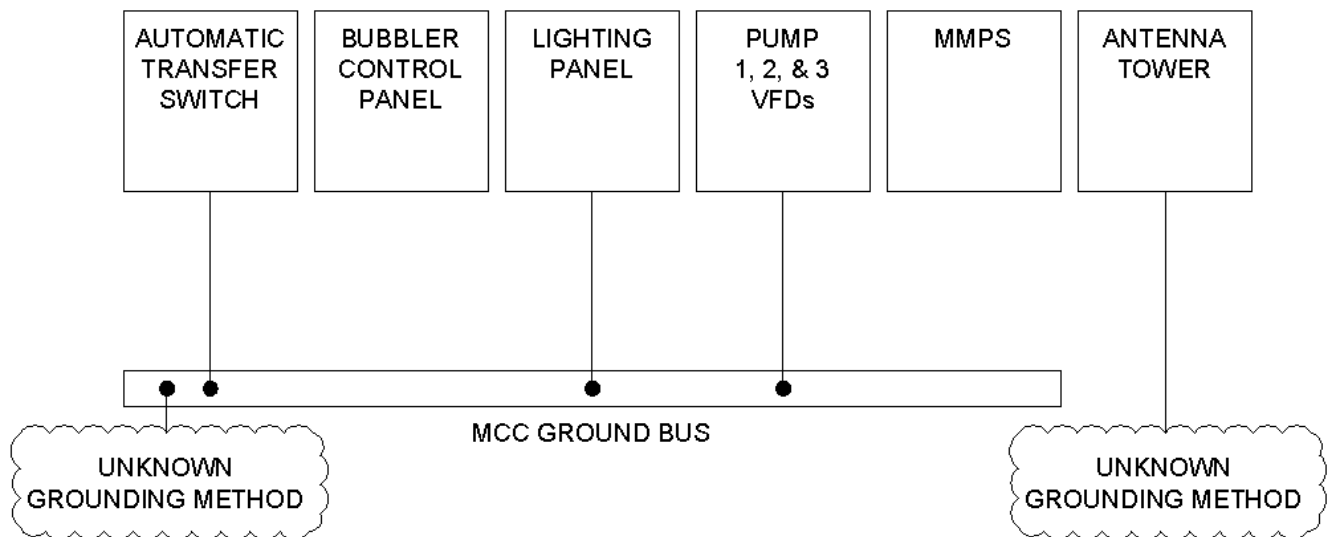


Figure 229-3. Colonial Williamsburg Grounding System

### Colonial Williamsburg Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment

- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 230 Rolling Hills Pump Station

### Rolling Hills Facility Description



Figure 230-1. Rolling Hills Pump Station Location Map



Figure 230-2. Rolling Hills Pump Station

<b>Table 230-1. Rolling Hills PS</b>	
Pumping Facility Number	230
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/15/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/4/2011
Date of Construction	1982
Address	414 Rolling Hills Dr, York Co
Receiving Facility	Williamsburg Treatment Plant
Design Head (Feet)	120 ft.
Firm Pumping Capacity (GPM)	1400 GPM
Total Pumping Capacity (GPM)	2100 GPM
Number of Pumps	3
Pump Type	Centrifugal
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	700 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	U.S. Electrical
Motor Nameplate Power (HP)	50
Generator Power (KW)	230

### Rolling Hills Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

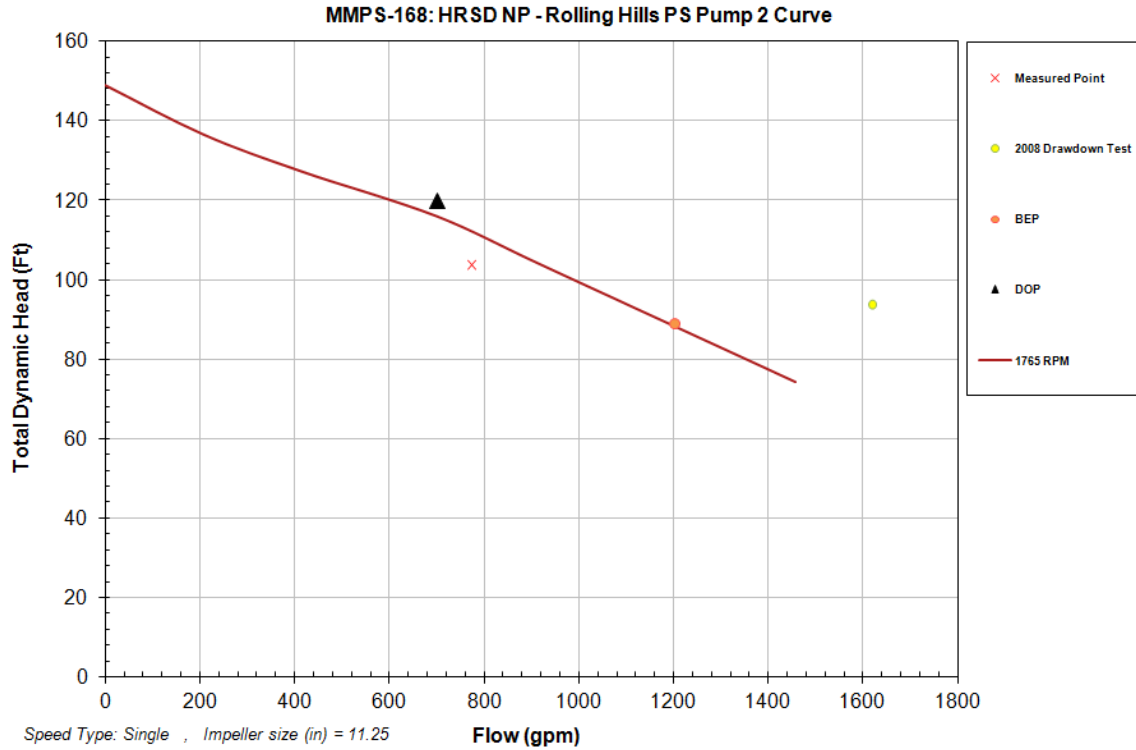
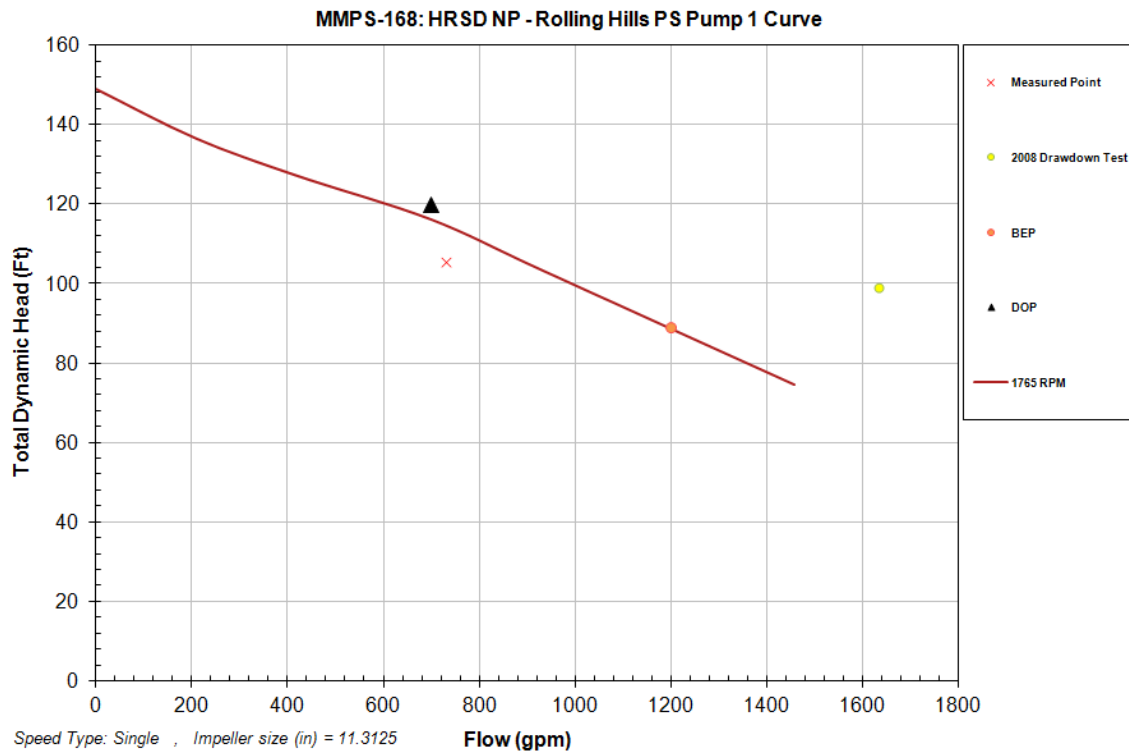
Table 230-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
230	Rolling Hills	Building	Building	2	1	Good	No Immediate Action Required	There is a tree leaning on the fence as well as several trees touching the building and vents.	1
230	Rolling Hills	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	Louver is clogged with dirt. The exhaust fan in the abandoned room is out of service.	1
230	Rolling Hills	Wet well	Wet well	2	2	Good	No Immediate Action Required	7/2011: HRSD PM inspection on 2/10/2011 indicates no major changes from the 2008 wet well data. Grease was reported.	1
230	Rolling Hills	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
230	Rolling Hills	Motor 1	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	strobe - 1782 rpm	1
230	Rolling Hills	Motor 2	Electrical Pump Motor and Controller	2	1	Good	No Immediate Action Required	Strobe - 1792 rpm	1
230	Rolling Hills	Motor 3	Electrical Pump Motor and Controller	2	2	Good Vibrates	No Immediate Action Required	Strobe = 1784 rpm. Vibration most likely coming from shaft.	1
230	Rolling Hills	Pump 1	Pump	2	3	Good Vibrating Shaft Deflection	Continue Scheduled Maintenance Activities	Pump made noise.	2
230	Rolling Hills	Pump 2	Pump	2	2	Good Cavitating	No Immediate Action Required	No nameplate. Clang in shaft at startup.	1
230	Rolling Hills	Pump 3	Pump	2	3	Good Vibrating Shaft Deflection Cavitating	Continue Scheduled Maintenance Activities	No nameplate. Cavitation did not seem severe. The shaft vibration appears to be causing the motor to vibrate as well.	2
230	Rolling Hills	Pump 4	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

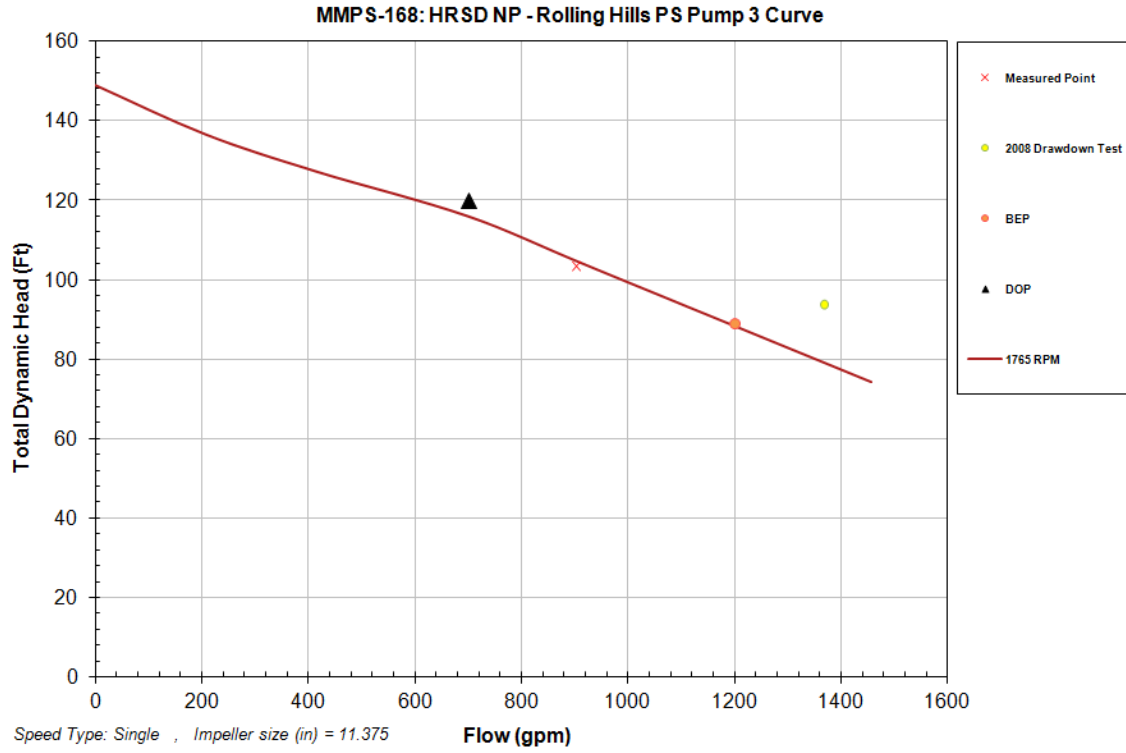
Table 230-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
230	Rolling Hills	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Pump station has 3 flow meters installed - 1 for each pump discharge line. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
230	Rolling Hills	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Check Valve Pump 2	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
230	Rolling Hills	Electrical Equipment	Electrical Equipment	2	1	Good	No Immediate Action Required	No Comment	1
230	Rolling Hills	Instrumentation System	Instrumentation System	2	1	Good	No Immediate Action Required	No Comment	1



Table 230-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
230	Rolling Hills	Bubbler Panel	Bubbler Panel	2	1	No panel door grounding wire is installed	No Immediate Action Required	No Comment	1
230	Rolling Hills	Compressor	Compressor	2	1	None to Report	No Immediate Action Required	No Comment	1
230	Rolling Hills	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
230	Rolling Hills	SCADA	SCADA	2	1	No panel door grounding wire. Terminals not labeled.	No Immediate Action Required	No Comment	1
230	Rolling Hills	Transfer Switch	Transfer Switch	3	2	Good No Panel Door Grounding Wire	Continue Scheduled Maintenance Activities	No Comment	2
230	Rolling Hills	Engine	Generator Drive Engine	3	1	Excessive/Dark Exhaust	Continue Scheduled Maintenance Activities	Excessive exhaust on startup only. Engine is in the motor room in close proximity to the motor controllers.	2
230	Rolling Hills	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1
230	Rolling Hills	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	Battery contacts are not properly protected.	1
230	Rolling Hills	Tank 1	Fuel Day Tank	2	1	Good	No Immediate Action Required	No Comment	1
230	Rolling Hills	Tank 2	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





### Rolling Hills Assets of Interest

None.

### Rolling Hills Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 2 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
  - Bubbler control panel is not protected by a surge suppressor.
- Equipment properly Grounded:
  - MMPS & Bubbler control panel are not bonded to the station grounding system.

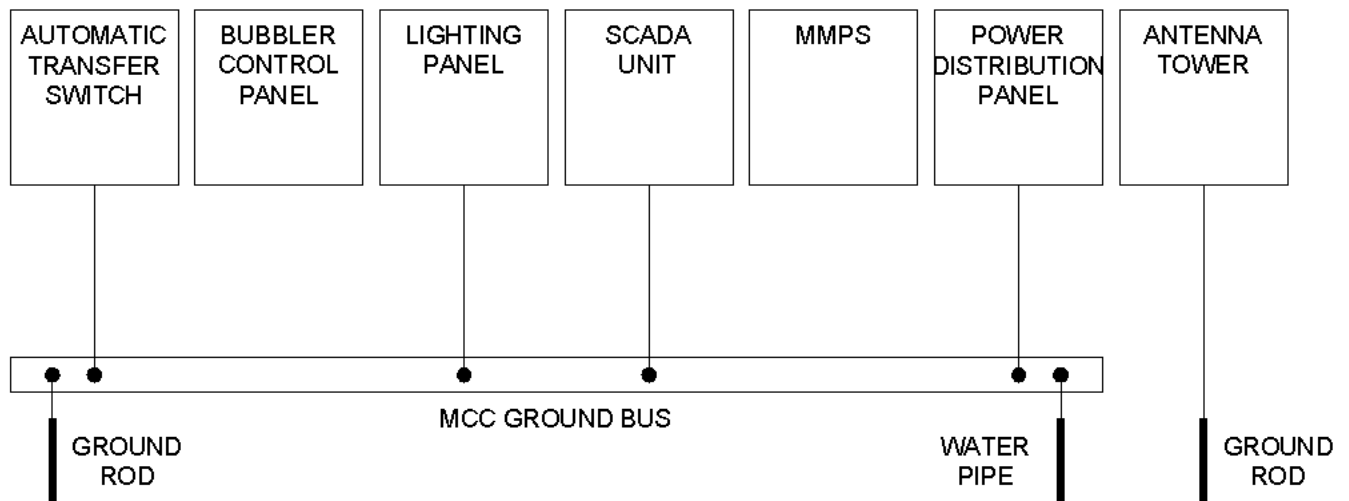


Figure 230-3. Rolling Hills Grounding System

### Rolling Hills Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment

- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

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## PS 231 Fords Colony Pump Station

### Fords Colony Facility Description

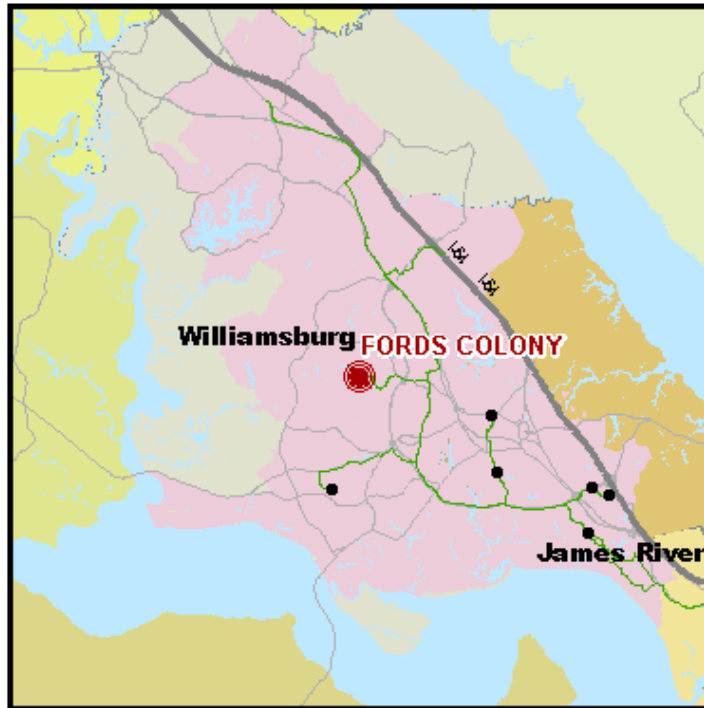


Figure 231-1. Fords Colony Pump Station Location Map



Figure 231-2. Fords Colony Pump Station

<b>Table 231-1. Fords Colony PS</b>	
Pumping Facility Number	231
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/13/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/2/2011
Date of Construction	1988
Address	430 Hempstead Road, Williamsburg
Receiving Facility	Williamsburg Treatment Plant
Design Head (Feet)	153 ft.
Firm Pumping Capacity (GPM)	5000 GPM
Total Pumping Capacity (GPM)	7500 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Fairbanks Morse
Pump Nameplate Capacity	2500 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Fairbanks Morse
Motor Nameplate Power (HP)	190
Generator Power (KW)	350

### **Fords Colony Results of Evaluation**

Results from the pumping facility field inspections are summarized in the following table.



**Table 231-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
231	Ford's Colony	Building	Building	2	1	Good	No Immediate Action Required	The site has a new fence, new driveway and new riprap. There is also a new meter vault onsite.	1
231	Ford's Colony	HVAC System	HVAC System	2	1	Good	No Immediate Action Required	The pump room exhaust vent diffuser is missing.	1
231	Ford's Colony	Wet well	Wet well	4	3	Concrete Corrosion	Schedule Corrective Action	The site has had a grinder installed. 10/2011: HRSD PM inspection on 10/19/2011 indicates exposed rebar and depth of concrete corrosion of up to 4" near the inlet. There are 2 leaks around gravity influent link seal.	3
231	Ford's Colony	Motor 1	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	Third pump and motor added when centrifugal pumps were replaced.	1
231	Ford's Colony	Motor 2	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
231	Ford's Colony	Motor 3	Wastewater Pump Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
231	Ford's Colony	Motor	Exhaust Fan Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
231	Ford's Colony	Motor	Exhaust Fan Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1
231	Ford's Colony	Motor	Waste Water Mixer Electrical Motor and Controller	2	1	Good	No Immediate Action Required	No Comment	1

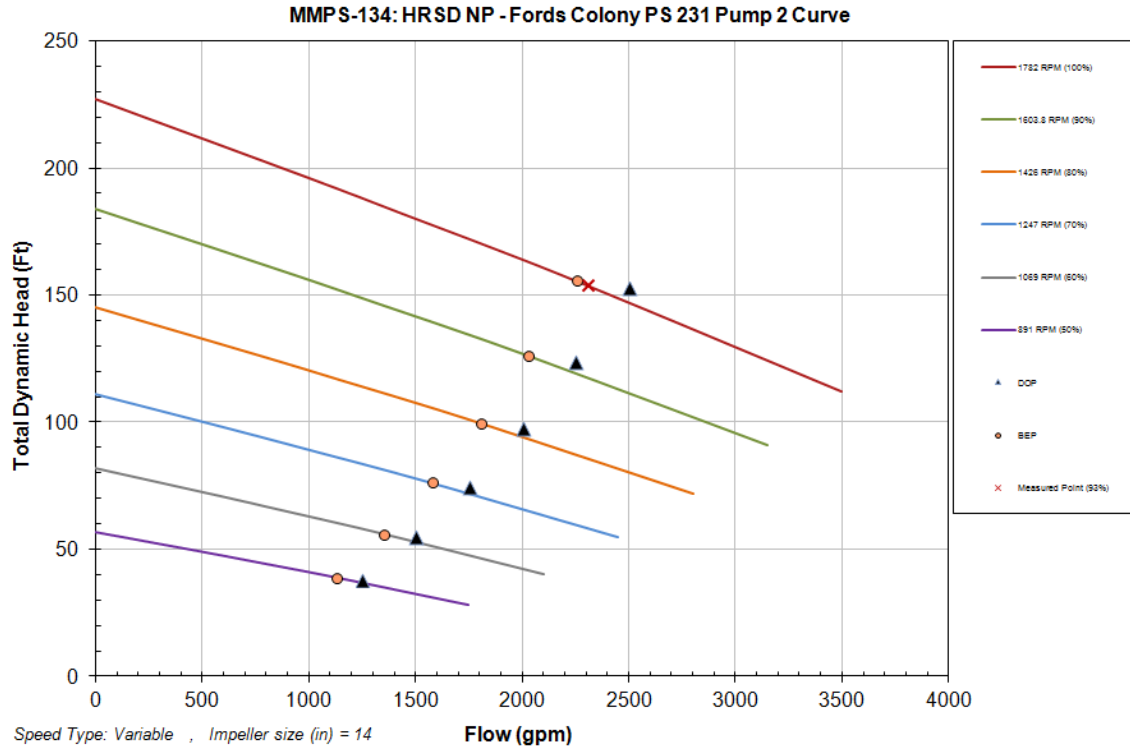
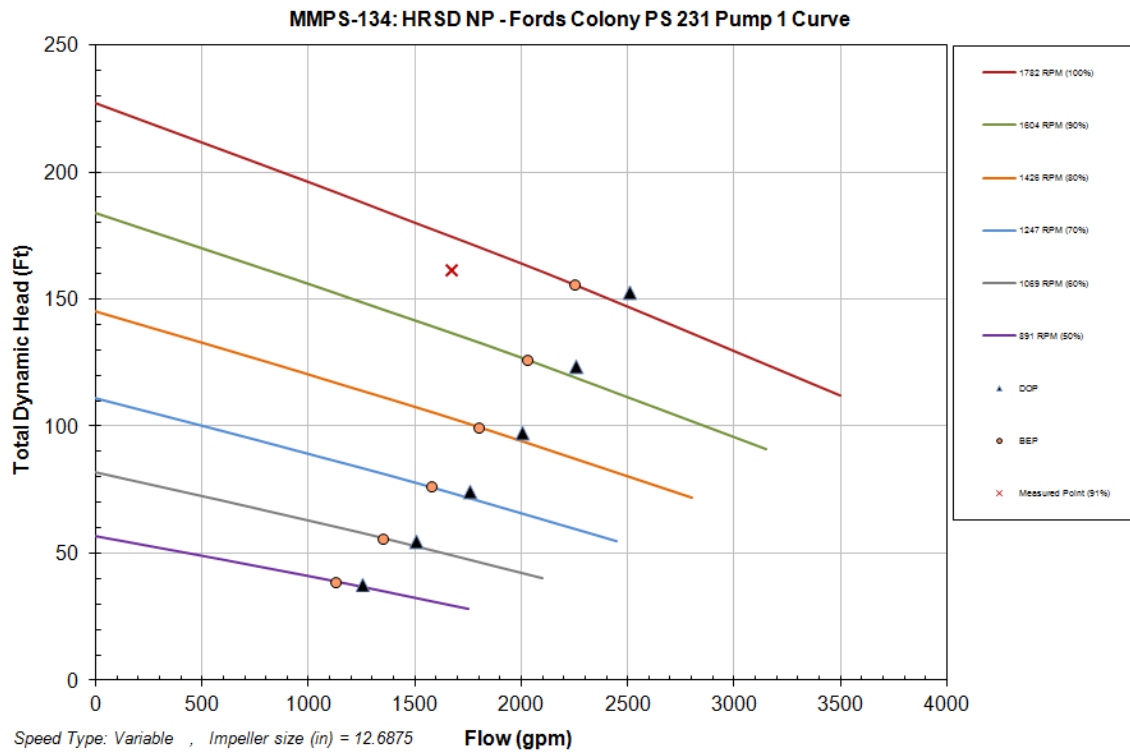
Table 231-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
231	Ford's Colony	Pump 1	Wastewater Pump Motor and Controller	1	2	Good	No Immediate Action Required	Third pump installed when centrifugal pumps were replaced. Pumps did not open check valve appreciably during test. Site visit flow: 1600 gpm, 1.0 fps	1
231	Ford's Colony	Pump 2	Wastewater Pump Motor and Controller	2	2	Good	No Immediate Action Required	Pumps did not open check valve appreciably during test. Site visit flow: 1600 gpm, 1.0 fps	1
231	Ford's Colony	Pump 3	Wastewater Pump Motor and Controller	2	2	Good	No Immediate Action Required	Pumps did not open check valve appreciably during test. Site visit flow: 1600 gpm, 1.0 fps	1
231	Ford's Colony	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Discharge piping beginning to corrode. 2 pumps in sump.	1
231	Ford's Colony	Pump	Sump Pump	2	1	Good	No Immediate Action Required	Discharge piping beginning to corrode. 2 pumps in sump.	1
231	Ford's Colony	Valves System	All Station Valves	2	1	Good	No Immediate Action Required	Check valve #2 has an audible slam on closure. A surge relief valve is installed. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
231	Ford's Colony	Suction Isolation Valve Pump 1	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Suction Isolation Valve Pump 2	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Suction Isolation Valve Pump 3	Suction Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Check Valve Pump 1	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Check Valve Pump 2	Check Valve	2	2	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

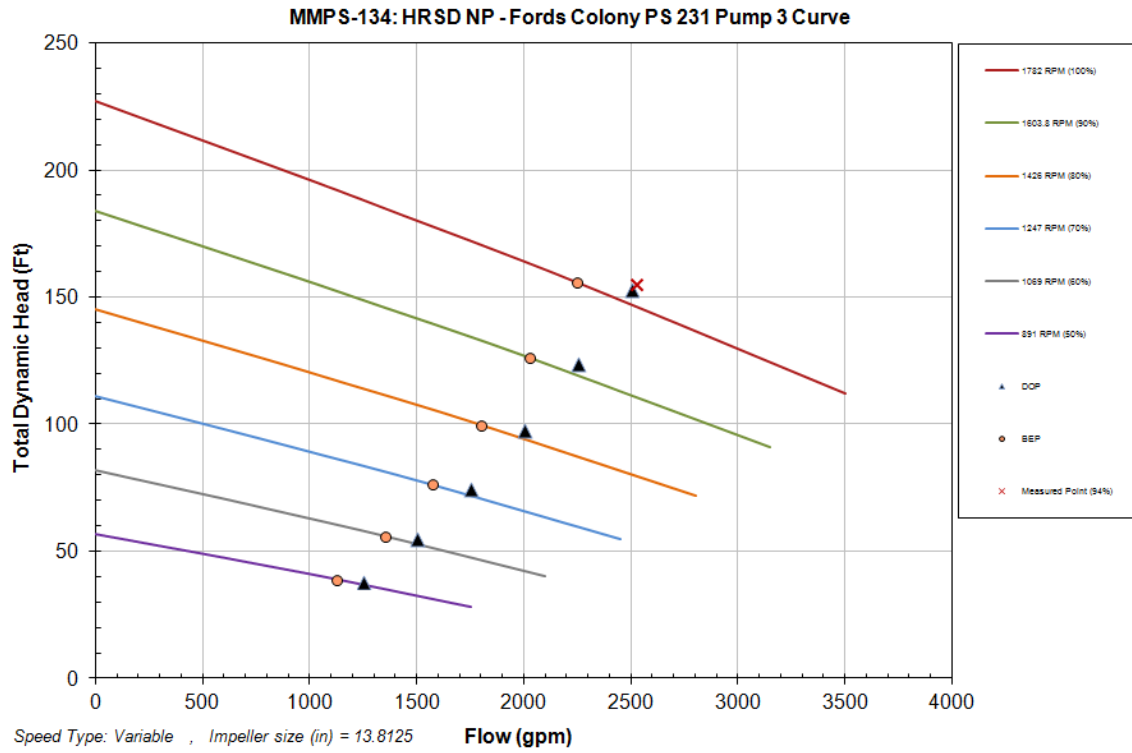
Table 231-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
231	Ford's Colony	Check Valve Pump 3	Check Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	2	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
231	Ford's Colony	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No Comment	1
231	Ford's Colony	Instrumentation System	Instrumentation System	1	1	None to Report	No Immediate Action Required	No Comment.	1
231	Ford's Colony	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
231	Ford's Colony	Compressor	Compressor	1	1	None to Report	No Immediate Action Required	No Comment	1
231	Ford's Colony	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
231	Ford's Colony	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
231	Ford's Colony	SCADA	SCADA	1	1	Located in the bubbler control panel	No Immediate Action Required	No Comment	1
231	Ford's Colony	Transfer Switch	Transfer Switch	1	1	Good No panel door ground wire.	No Immediate Action Required	No Comment	1
231	Ford's Colony	Engine	Generator Drive Engine	2	1	Good	No Immediate Action Required	No Comment	1
231	Ford's Colony	Generator	Generator	2	1	Good	No Immediate Action Required	No Comment	1

**Table 231-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
231	Ford's Colony	Batteries and Charger	Batteries and Charger	2	1	Good	No Immediate Action Required	No Comment	1
231	Ford's Colony	Tank 1	Fuel Tank	2	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





Fords Colony PS pumps were replaced since the 2008 draw down tests. 2008 point is not shown.

### Fords Colony Assets of Interest

After the initial round of inspections, HRSD used a specialty contractor to revisit select stations for wet well structural inspections including concrete strength tests. Test results showed that the Fords Colony wet well is deteriorating.



Figure 231-3. Fords Colony Wet Well Slab

### Fords Colony Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
- Equipment properly Grounded:
  - MMPS & pump J-Box are not bonded to the station grounding system.

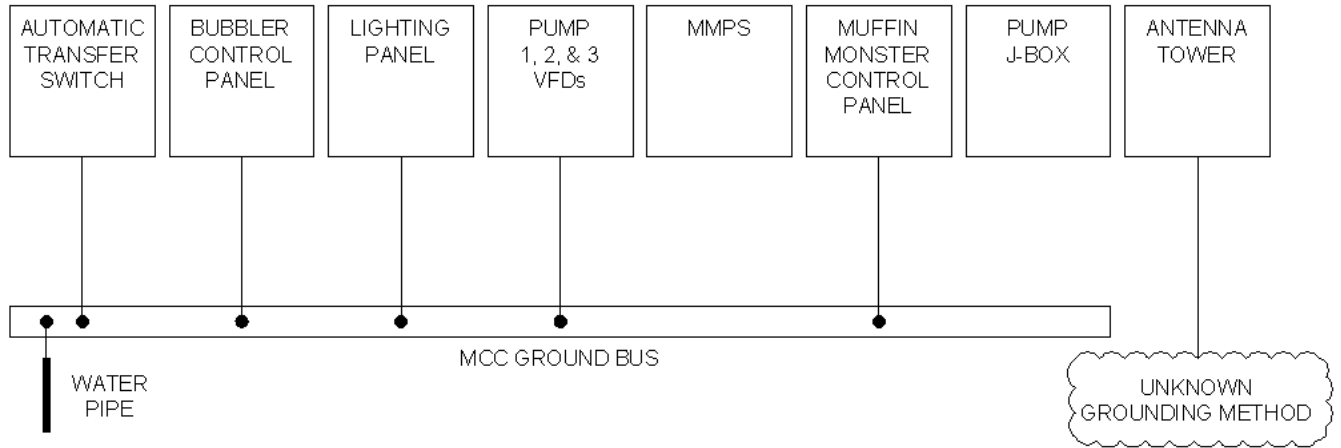


Figure 231-4. Fords Colony Grounding System

**Fords Colony Electrical Systems Field Observations**

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable
- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other



## PS 232 Greensprings Pump Station

### Greensprings Facility Description

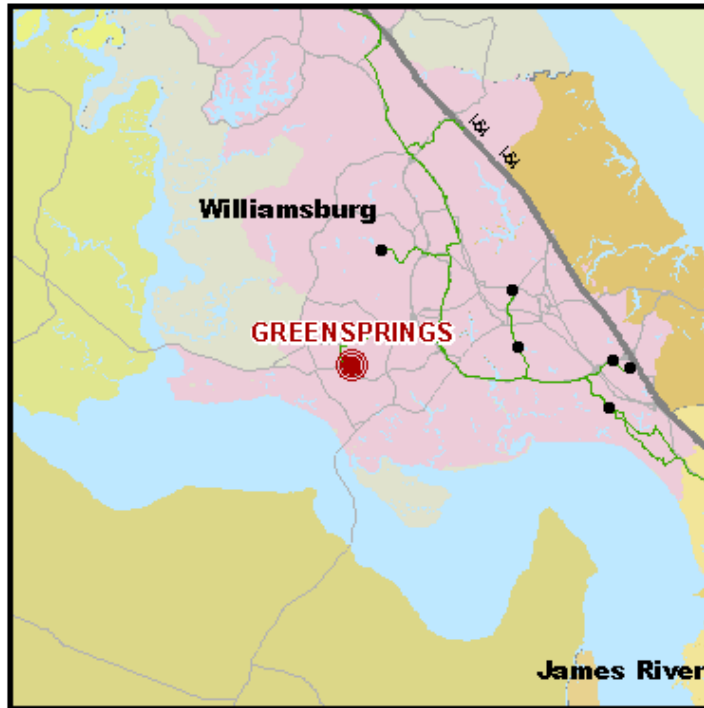


Figure 232-1. Greensprings Pump Station Location Map



Figure 232-2. Greensprings Pump Station

<b>Table 232-1. Greensprings PS</b>	
Pumping Facility Number	232
Date of Initial Inspection	7/1/2008
Date of Update Inspection	6/13/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/2/2011
Date of Construction	2002
Address	3900 John Tyler Mem. Hwy, Williamsburg
Receiving Facility	Williamsburg Treatment Plant
Design Head (Feet)	182 ft.
Firm Pumping Capacity (GPM)	5200 GPM
Total Pumping Capacity (GPM)	7800 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Flygt
Pump Nameplate Capacity	2600 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Flygt
Motor Nameplate Power (HP)	185
Generator Power (KW)	400

### Greensprings Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 232-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
232	Greensprings	Building	Building	1	1	Good	No Immediate Action Required	No Comment	1
232	Greensprings	HVAC System	HVAC System	1	1	Good	No Immediate Action Required	Calgon activated carbon odor control system. NY Blower - 3743 rpm, 600cfm, 3.82hp. Bird screen is damaged on both sides of the odor control unit Dry well ventilation is loud.	1
232	Greensprings	Wet well	Wet well	2	1	Good	No Immediate Action Required	The site has had a grinder installed. 7/2011: HRSD PM inspection on 1/4/2011 indicates no major changes from the 2008 wet well data. There was moderate grease buildup. Personnel report that air entrainment in influent channel causing operational issues.	1
232	Greensprings	Influent Valve	Influent Valve	2	1	None to Report	No Immediate Action Required	No Comment	1
232	Greensprings	Motor 1	Wastewater Pump Motor and Controller	1	1	Good	No Immediate Action Required	A third motor and pump were added when the Fairbanks Morse pumps were replaced.	1
232	Greensprings	Motor 2	Electrical Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
232	Greensprings	Motor 3	Electrical Pump Motor and Controller	1	1	Good	No Immediate Action Required	No Comment	1
232	Greensprings	Motor	Exhaust Fan Motor and Controller	2	1	Good	No Immediate Action Required	Control Room	1
232	Greensprings	Motor	Exhaust Fan Motor and Controller	2	1	Good	No Immediate Action Required	Pump Room	1

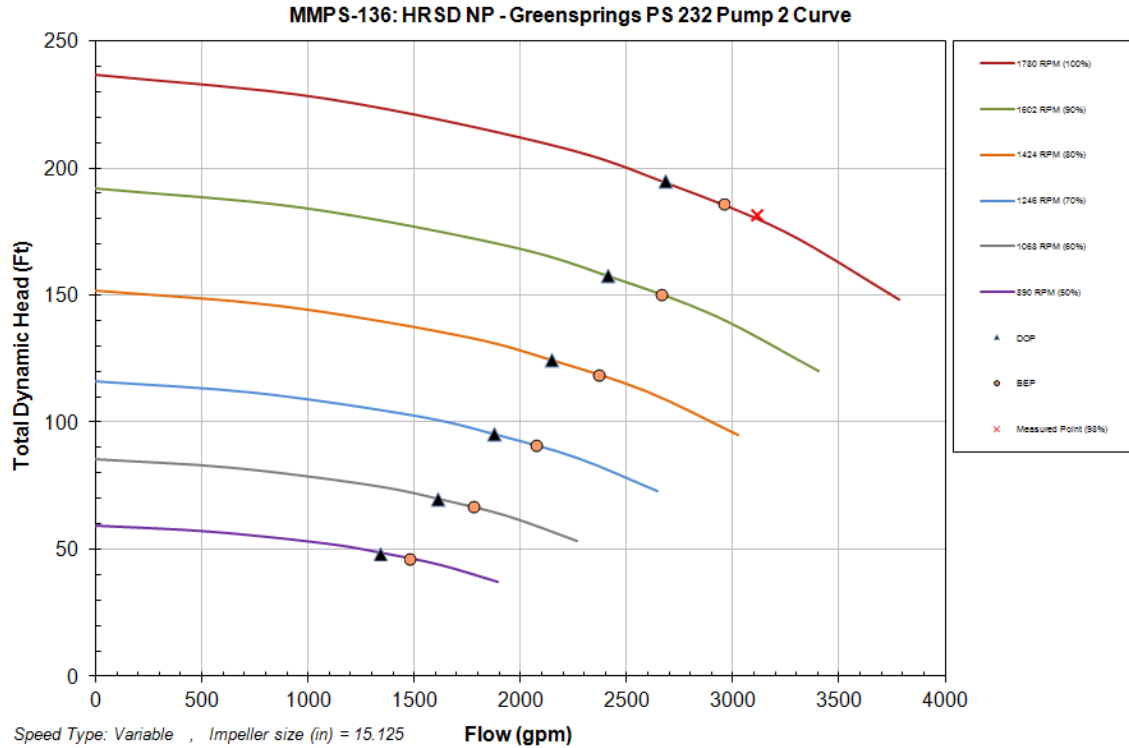
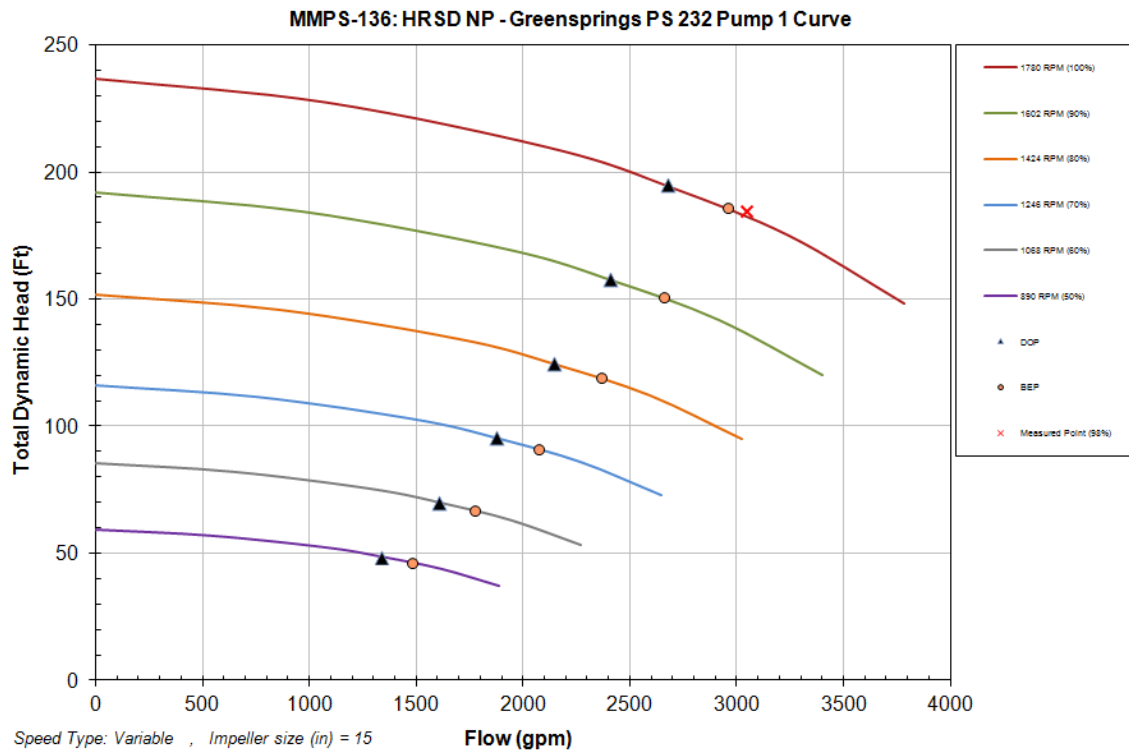
Table 232-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
232	Greensprings	Motor	Exhaust Fan Motor and Controller	2	1	Good	No Immediate Action Required	Wet well	1
232	Greensprings	Pump 1	Wastewater Pump Motor and Controller	1	2	Good Cavitating	No Immediate Action Required	The station was operating at approximately 900 gpm and 0.8 to 0.9 fps at time of visit. All three pumps were cavitating and vibrating to some degree during test. This is most likely due to low flow conditions rather than mechanical issues.	1
232	Greensprings	Pump 2	Wastewater Pump Motor and Controller	1	2	Good Cavitating	No Immediate Action Required	The station was operating at approximately 900 gpm and 0.8 to 0.9 fps at time of visit. All three pumps were cavitating and vibrating to some degree during test.. This is most likely due to low flow conditions rather than mechanical issues.	1
232	Greensprings	Pump 3	Wastewater Pump Motor and Controller	1	3	Good Vibrating Cavitating	Continue Scheduled Maintenance Activities	Newly installed when Fairbanks Morse pumps were replaced. (Third pump added.). Pump 3 just barely opens the check valve at 75%. Vibrates more than the other 2 pumps. All three pumps were cavitating and vibrating to some degree during test. This is most likely due to low flow conditions rather than mechanical issues. conditions.	2
232	Greensprings	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

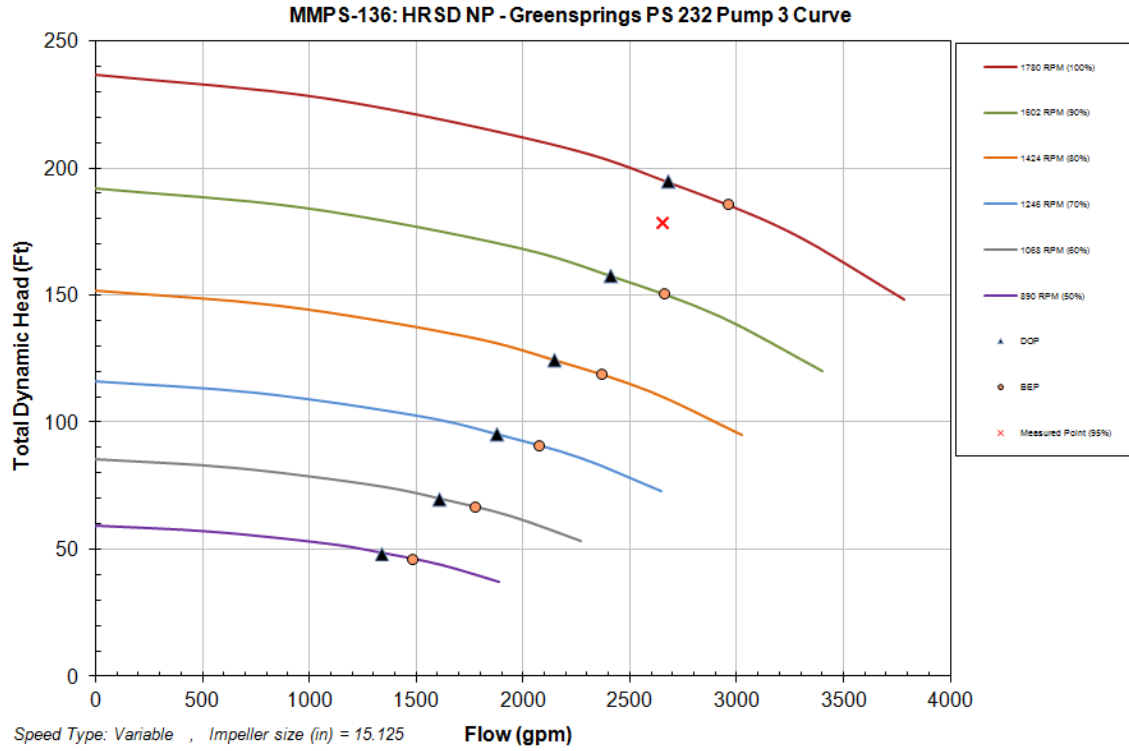
Table 232-2. Pumping Facility Asset Condition and Performance Ratings									
PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
232	Greensprings	Valves System	All Station Valves	1	1	Good	No Immediate Action Required	The old discharge isolation valves were replaced with ones that are closer to the pump at ground level. The old valves are fully opened with the handwheels removed.  7/11: HRSD inspections indicate no problems with isolation valve operation.	1
232	Greensprings	Suction Isolation Valve Pump 1	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Suction Isolation Valve Pump 2	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Suction Isolation Valve Pump 3	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Check Valve Pump 1	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Check Valve Pump 2	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Check Valve Pump 3	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

Table 232-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
232	Greensprings	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
232	Greensprings	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No Comment	1
232	Greensprings	Instrumentation System	Instrumentation System	1	1	Good	No Immediate Action Required	Pressure transducers	1
232	Greensprings	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
232	Greensprings	Compressor	Compressor	1	1	None to Report	No Immediate Action Required	No Comment	1
232	Greensprings	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
232	Greensprings	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
232	Greensprings	SCADA	SCADA	1	1	Located in the bubbler control panel	No Immediate Action Required	No Comment	1
232	Greensprings	Transfer Switch	Transfer Switch	1	1	Good No Panel Door Grounding Wire	No Immediate Action Required	No Comment	1
232	Greensprings	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	There is an oil drip on the slab. No leak confirmed.	1
232	Greensprings	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
232	Greensprings	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1
232	Greensprings	Tank 5	Fuel Tank	1	1	Good	No Immediate Action Required	UST - Not inspected beyond what is visible at ground level.	1

### Draw-Down Testing





Greensprings PS pumps were replaced since the 2008 draw down tests. 2008 point is not shown.



## Greensprings Assets of Interest

None.

## Greensprings Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio.
- Equipment properly Grounded:
  - MMPS is not bonded to the station grounding system.

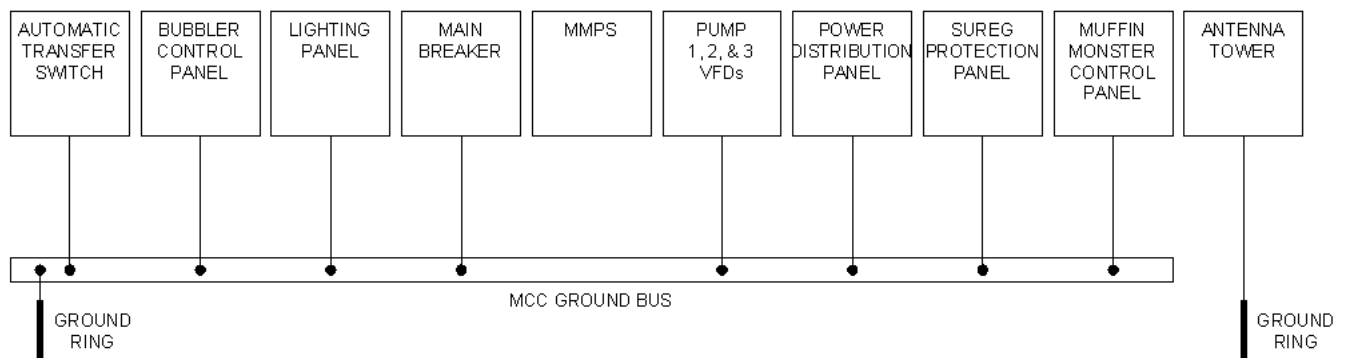


Figure 232-3. Greensprings Grounding System

## Greensprings Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
- Adequate Workspace around Equipment
- Equipment not damaged
- Exterior Free of Debris, Dust, & Obstructions
- Exterior Paint Conditions Adequate
- Adequate Illumination Available
- Equipment is Labeled Correctly
- Required nameplates and signage readable

- Equipment Labeled Where it is being Fed From
- Equipment Properly Grounded
- Correct Voltage Warning Signs
- Doors Close Properly
- Conduit Entrances are not obstructed
- Conduits Entering from Outside are Sealed
- Circuit Breakers Labeled Correctly with Loads
- Breaker Handle and Lock out Loop Intact
- Equipment Accommodates Lock Out / Tag Out
- Required Receptacles Provided
- Necessary Disconnecting Means Provided
- Buses Free of Corrosion
- Lugs Free of Corrosion
- Building Electrical Plans Provided
- Other

## PS 233 Lodge Rd Pump Station

### Lodge Rd Facility Description

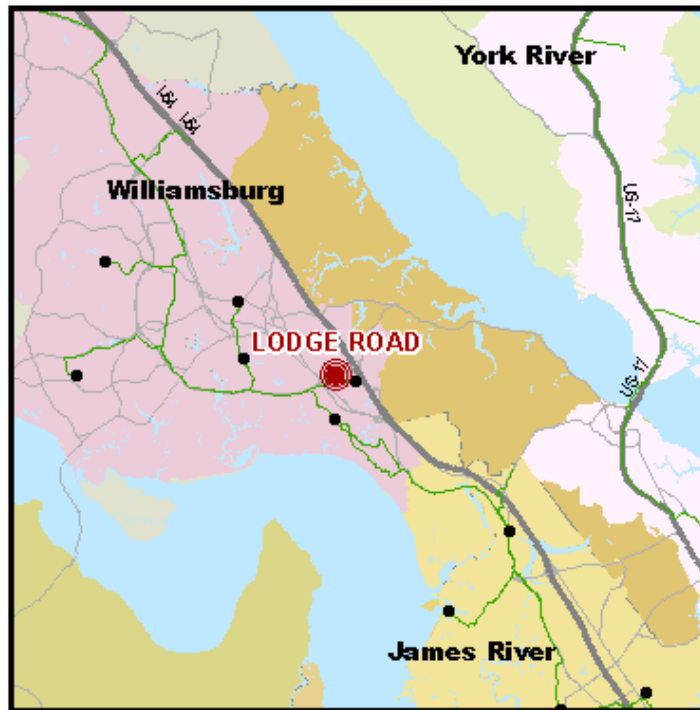


Figure 233-1. Lodge Rd Pump Station Location Map



Figure 233-2. Lodge Rd Pump Station

<b>Table 233-1. Lodge Rd PS</b>	
Pumping Facility Number	233
Date of Initial Inspection	Not Inspected in 2008
Date of Update Inspection	6/15/2011
Date of Electrical and Grounding/Lightning Strike Protection Inspection	8/2/2011
Date of Construction	2002
Address	202 Lodge Road, York County
Receiving Facility	Williamsburg Treatment Plant
Design Head (Feet)*	90 ft.
Firm Pumping Capacity (GPM)*	3600 GPM
Total Pumping Capacity (GPM)*	5400 GPM
Number of Pumps	3
Pump Type	Dry-pit Submersible
Pump Manufacturer	Flygt
Pump Nameplate Capacity	1800 GPM
Standby Pump(s) present during inspection	None
Motor Manufacturer	Flygt
Motor Nameplate Power (HP)	100
Generator Power (KW)	240

*\*Design Head, Firm Pumping Capacity and Total Pumping Capacity read from pump curve at peak efficiency*

### Lodge Rd Results of Evaluation

Results from the pumping facility field inspections are summarized in the following table.

Table 233-2. Pumping Facility Asset Condition and Performance Ratings

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
233	Lodge Road	Building	Building	1	1	Good	No Immediate Action Required	2 ton crane.	1
233	Lodge Road	HVAC System	HVAC System	1	2	Good	No Immediate Action Required	Dry well supply fan screen is 90% clogged with dirt. There did not appear to be a way to remove the screen.	1
233	Lodge Road	Wet well	Wet well	2	2	Needs Cleaning	No Immediate Action Required	Ops reports frequent cleaning because of grease. 7/2011: HRSD PM inspection on 01/10/11 indicates good condition and mentions grease buildup. Personnel report that air entrainment in influent channel causing operational issues.	1
233	Lodge Road	Influent Valve	Sluice Gate	2	3	Good	Continue Scheduled Maintenance Activities	HRSD inspection reports states that valve operates easily but does not close completely.	2
233	Lodge Road	Motor 1	Lodge Road - Wastewater Pump Motor and Controller - 01	1	1	Good	No Immediate Action Required	No Comment	1
233	Lodge Road	Motor 2	Lodge Road - Wastewater Pump Motor and Controller - 02	1	1	Good	No Immediate Action Required	No Comment	1
233	Lodge Road	Motor 3	Lodge Road - Wastewater Pump Motor and Controller - 03	See Comments	See Comments	See Comments	Continue Scheduled Maintenance Activities	Pump and Motor were removed during inspection	2
233	Lodge Road	Pump 1	Wastewater Pump	1	2	Good	No Immediate Action Required	Pump made noises. Crew was onsite to derag the pump.	1
233	Lodge Road	Pump 2	Wastewater Pump	1	1	Good	No Immediate Action Required	No Comment	1
233	Lodge Road	Pump 3	Wastewater Pump	See Comments	See Comments	See Comments	Continue Scheduled Maintenance Activities	Pump and Motor were removed during inspection	2
233	Lodge Road	Pump	Sump Pump	2	1	Good	No Immediate Action Required	No Comment	1

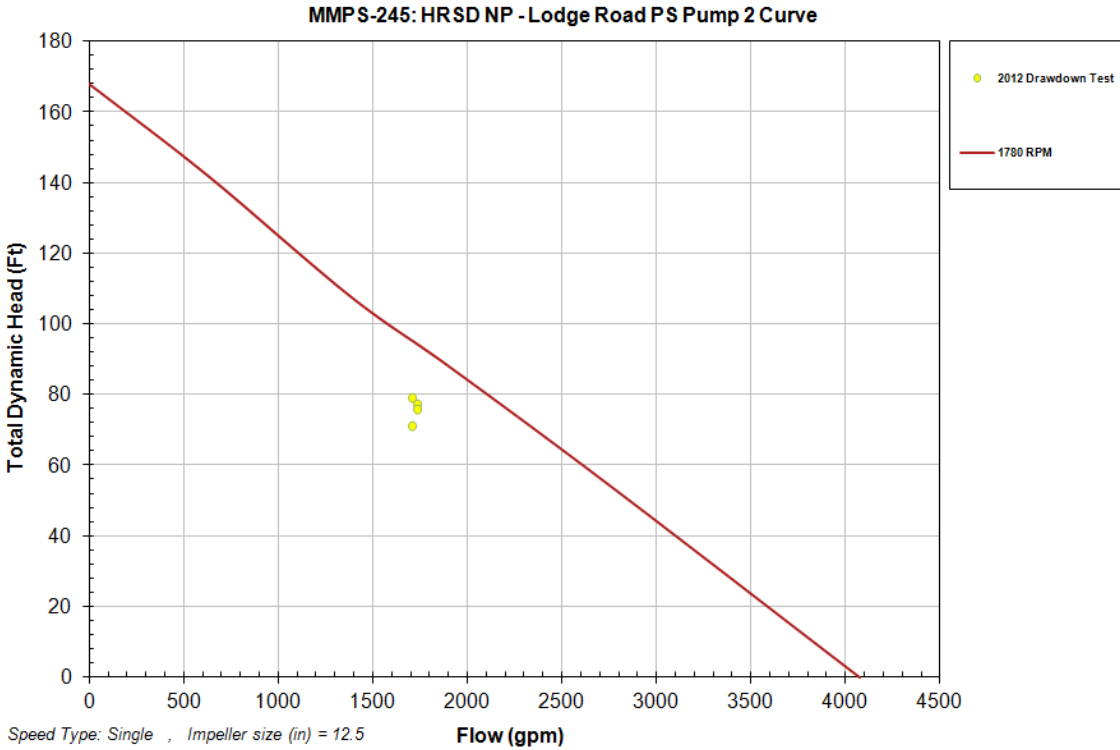
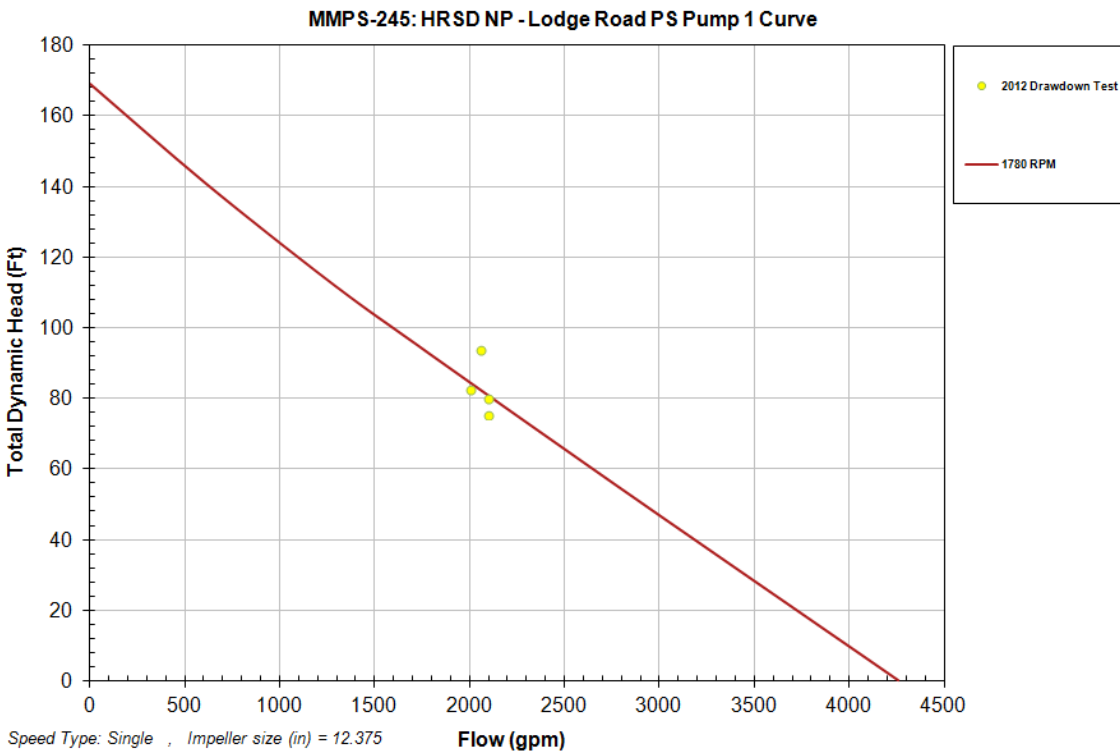
**Table 233-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
233	Lodge Road	Valves System	All Station Valves	1	1	None to Report	No Immediate Action Required	Check valve #1 had signs of past leakage. Check valve #3 performance not verified because pump was removed. 7/11: HRSD inspections indicate no problems with isolation valve operation.	1
233	Lodge Road	Suction Isolation Valve Pump 1	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
233	Lodge Road	Suction Isolation Valve Pump 2	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
233	Lodge Road	Suction Isolation Valve Pump 3	Suction Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
233	Lodge Road	Check Valve Pump 1	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
233	Lodge Road	Check Valve Pump 2	Check Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
233	Lodge Road	Check Valve Pump 3	Check Valve	1	See Comments	See Valves System Field Observations	Continue Scheduled Maintenance Activities	See Valves System Comments	2
233	Lodge Road	Discharge Isolation Valve Pump 1	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
233	Lodge Road	Discharge Isolation Valve Pump 2	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1
233	Lodge Road	Discharge Isolation Valve Pump 3	Discharge Isolation Valve	1	1	See Valves System Field Observations	No Immediate Action Required	See Valves System Comments	1

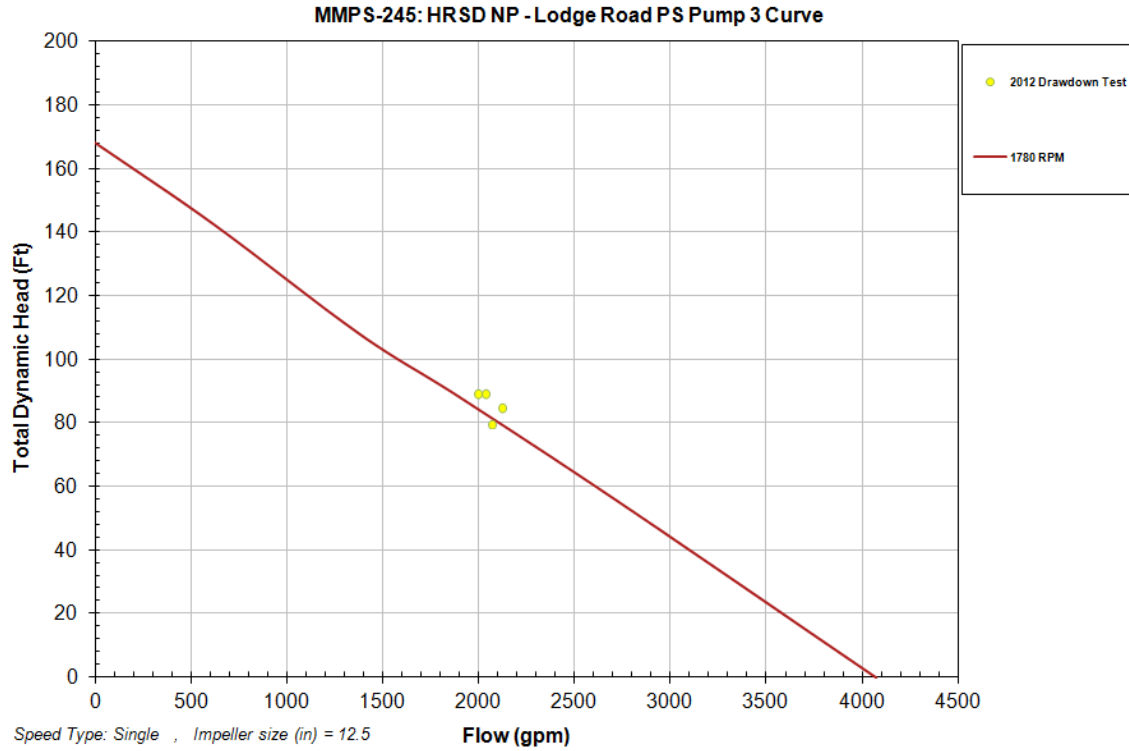
**Table 233-2. Pumping Facility Asset Condition and Performance Ratings**

PS	PS Name	Asset Type	Asset Description	Condition Rating	Performance Rating	Field Observations	Recommendation	Comments	Region
233	Lodge Road	Electrical Equipment	Electrical Equipment	1	1	Good	No Immediate Action Required	No Comment	1
233	Lodge Road	Instrumentation System	Instrumentation System	1	1	None to Report	No Immediate Action Required	No Comment	1
233	Lodge Road	Bubbler Panel	Bubbler Panel	1	1	None to Report	No Immediate Action Required	No Comment	1
233	Lodge Road	Compressor	Compressor	1	1	None to Report	No Immediate Action Required	No Comment	1
233	Lodge Road	VFD	VFD	1	1	None to Report	No Immediate Action Required	No Comment	1
233	Lodge Road	MMPS	MMPS	1	1	None to Report	No Immediate Action Required	No Comment	1
233	Lodge Road	SCADA	SCADA	2	1	No panel door grounding wire	No Immediate Action Required	No Comment	1
233	Lodge Road	Transfer Switch	Transfer Switch	1	1	Good	No Immediate Action Required	No Comment	1
233	Lodge Road	Engine	Generator Drive Engine	1	1	Good	No Immediate Action Required	Natural gas.	1
233	Lodge Road	Generator	Generator	1	1	Good	No Immediate Action Required	No Comment	1
233	Lodge Road	Batteries and Charger	Batteries and Charger	1	1	Good	No Immediate Action Required	No Comment	1

### Draw-Down Testing







The drawdown test pump curves for Lodge Road Pump Station do not display the Best Efficiency Point (BEP) or the the Design Operating Point (DOP) due to the information not being readily available. HRSD performed physical draw down tests in 2012. A Telog-based Measured Point is not shown.

### Lodge Rd Assets of Interest

None.

### Lodge Rd Lightning Protection Field Observations

- Service Entrance Surge Protection Device Installed
- Air Terminals Installed and Bonded to Ground System
- Ground Rod Test Wells Noticeable
- Ground Rods Noticeable
  - 0 Rod(s) Noticeable
- Indications of a Building Ground Ring
- No History of Lightning Strikes
- No History of Failures Resulting in SSO in Past 5 Years
- Equipment properly Surge Protected:
  - SCADA Unit has no surge suppression on coax between Antenna & radio
  - Bubbler control panel is not protected by a surge suppressor
- Equipment properly Grounded:
  - MMPS & SCADA Unit are not bonded to the station grounding system

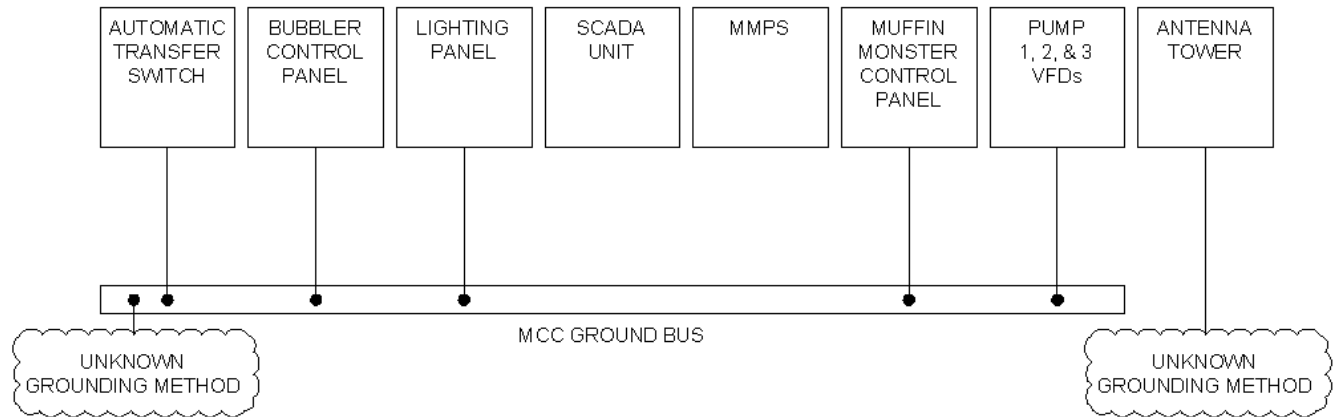


Figure 233-3. Lodge Rd Grounding System

### Lodge Rd Electrical Systems Field Observations

- Good
- N/A
- Panel Corroded
- Panel Obsolete
- Contacts Loose
- Cables Fatigued and Cracked
- Dust Inside Panel
- Bare Wires
- Switch Gear Worn
- Cooling Fan Filter Old/Clogged (If Present)
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- Buses Free of Corrosion
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- Building Electrical Plans Provided
- Other

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