QUARTERLY REPORT

APRIL 1 – JUNE 30, 2023

Hampton Roads Sanitation District

1434 Air Rail Avenue

Virginia Beach, VA 23455

September 18, 2023

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1. Introduction and Purpose

On September 26, 2007, the Hampton Roads Sanitation District (HRSD) entered into a Special Order by Consent (SOC) with the Virginia Department of Environmental Quality (DEQ) and thirteen (13) area Localities for the purpose of resolving certain alleged violations of environmental laws and regulations related to Sanitary Sewer Overflows (SSOs). On February 23, 2010, HRSD entered into an Amended Consent Decree ("Consent Decree") with the United States of America and the Commonwealth of Virginia for the purpose of fulfilling the objectives of the Clean Water Act and the Virginia State Water Control Law. This Consent Decree has been modified five times by agreement of all parties in 2011, 2013, 2014, 2017, and 2022. In December 2014, the SOC was eliminated by DEQ and HRSD is no longer under state enforcement. On February 8, 2022, the Fifth Amendment to the Consent Decree was entered.

The Fifth Amendment to the Consent Decree requires:

"HRSD will submit quarterly SSO reports to VADEQ and EPA, in which HRSD will identify all SSOs, SSDs, Prohibited Bypasses, or unauthorized discharges from the HRSD SS System or the HRSD STPs. HRSD will identify those SSOs, SSDs, Prohibited Bypasses, or unauthorized discharges for which it asserts a claim of force majeure. If HRSD asserts a force majeure claim, it shall document the basis for such claim in the quarterly SSO reports. It will pay the associated undisputed stipulated penalties for all SSOs, SSDs, Prohibited Bypasses, or unauthorized discharges for which it did not assert a claim of force majeure within 90 days of the close of each calendar quarter. In addition, HRSD will submit all of HRSD's post-storm synopses reports for rain events during the quarterly reporting period to VADEQ and EPA as part of the quarterly reports for rain events that satisfy HRSD's current criteria for publishing a post-storm analysis, i.e.: (a.) one or more rain gauge sites meet a two-year or greater rainfall recurrence interval and at least 50% of sites in any treatment plant service area receive one inch of rainfall or greater; (b.) a rain gauge meets a five-year or greater rainfall recurrence interval; or (c.) a weather-related SSO occurs."

This quarterly report is submitted pursuant to Section XVII.D of the Consent Decree. HRSD has prepared this quarterly report in accordance with the above requirements to apprise the EPA (representing the United States of America) and the DEQ (representing the Commonwealth of Virginia) of steps taken toward meeting the obligations of the Consent Decree. Specifically, this quarterly report summarizes all Sanitary Sewer Overflows (SSOs), Sanitary Sewer Discharges (SSDs), Prohibited Bypasses, or unauthorized discharges from the HRSD Sanitary Sewer System or the HRSD Sewage Treatment Plants from April 1, 2023, through June 30, 2023, the associated post-storm synopses reports, claims of force majeure, and undisputed stipulated penalties.

During the reporting period, there were a total of eleven (11) SSOs, SSDs, Prohibited Bypasses, and unauthorized discharges from the HRSD SS System or the HRSD STPs. These are summarized in Tables 1 & 2.

2. Claim of Force Majeure

2.1. Sanitary Sewer Overflow

There were four (4) SSOs from the HRSD SS System during the 3-month reporting period. HRSD asserts a force majeure claim for one (1) of the SSOs.

2.1.1. Basis of Claim

A description of the circumstances supporting a claim of force majeure is included in Table 1.

2.2. Unusual Discharges (Sanitary Sewer Discharge, Prohibited Bypasses, Unauthorized Discharge)

There were seven (7) unusual discharges from the HRSD SS System or the HRSD STPs during the 3-month reporting period. HRSD asserts a force majeure claim for five (5) Unusual Discharges that were non potable water or final effluent.

2.2.1. Basis of Claim

A description of the circumstances supporting a claim of force majeure is included in Table 2.

3. Undisputed Stipulated Penalties

3.1. Sanitary Sewer Overflow

There were four (4) SSOs from the HRSD SS System during the 3-month reporting period. HRSD will pay undisputed stipulated penalties in the amount of $3,250 for three (3) SSOs.

3.1.1. Basis of Undisputed Stipulated Penalties

Calculation of undisputed stipulated penalties is outlined in Section XX "Stipulated Penalties" paragraph 110 of the Consent Decree. The calculated stipulated penalties are shown in Table 1.

Volume of the SSD or Prohibited Bypass	Penalty from the date of entry
Less than 100 gallons	$ 100
100 to 2,499 gallons	$ 750
2,500 to 9,999 gallons	$ 1,250
10,000 to 99,999 gallons	$ 4,700
100,000 to 999,999 gallons	$ 10,000
1,000,000 gallons or greater	$ 15,000

3.2. Unusual Discharges (Sanitary Sewer Discharge, Prohibited Bypasses, Unauthorized Discharge)

There were seven (7) unusual discharges from the HRSD SS System or the HRSD STPs during the 3-month reporting period. HRSD will pay undisputed stipulated penalties in the amount of $1,500 for two (2) Unusual Discharges.

3.2.1. Basis of Undisputed Stipulated Penalties

Calculation of undisputed stipulated penalties is outlined in Section XX "Stipulated Penalties" paragraph 110 of the Consent Decree. The calculated stipulated penalties are shown in Table 2.

Volume of the SSD or Prohibited Bypass	Penalty from the date of entry
Less than 100 gallons	$ 100
100 to 2,499 gallons	$ 750
2,500 to 9,999 gallons	$ 1,250
10,000 to 99,999 gallons	$ 4,700
100,000 to 999,999 gallons	$ 10,000
1,000,000 gallons or greater	$ 15,000

4. Post-Storm Synopses Reports

Post-Storm Synopses Reports are generated when:

- One or more rain gauge sites meets a two year or greater rainfall recurrence interval and 50% of sites receive one inch or greater rainfall
- A rain gauge meets a five-year or greater rainfall recurrence interval or
- A capacity related wet weather SSO occurs

There were four (4) Post-Storm Synopses Reports for the 3-month reporting period.

Table 1. Detailed Listing of HRSD SSOs (April 1, 2023 to June 30, 2023)												
Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO	Discharge Quantity (gallons)**	Amount Reaching State Waters (gallons)**	DEQ IR	Force Majeure Rationale or Stipulated Penalty
4/30/2023 6:16:00 PM	321 North Avenue	North Avenue PS	Ground to James River	Newport News	Capacity-Weather Related	Significant rainfall resulted in increased system flows and pressures. Hilton School PS saw a maximum rainfall of 0.81" in 15 minutes (04/30/23 at 5:00 pm), with a total of 1.74" falling in 1 hour. Total rainfall for the rain event for this rain gauge was 2.84"; 2-5yr RRI.	2 hour(s) 21 minute(s)	Verified that the pumps and pump station were operating properly.	7,050	7,050	SSORS #2023-T-106260	$1,250
5/24/2023 4:30:00 PM	Effingham Street and Green Street	Effingham Street FM	Storm drain to Scotts Creek / Elizabeth River	Portsmouth	Third Party Action	A contractor for HRSD spilled approximately 500 gallons of sewage on the roadway. The sewage material was waste product from cleaning the Effingham line in prep for condition assessment work and was mostly water, debris, and grit that was removed from the pipe. The vac truck that had been used to remove the sewage from the pipe had a loose hatch lid that opened after the vactor was shut off.	0 hour(s) 1 minute(s)	A second vactor was used to collect approximately 400 gallons from the road and storm drain. Area was treated with lime and bleach.	500	100	SSORS #2023-T-106272	$750

Table 1. Detailed Listing of HRSD SSOs

(April 1, 2023 to June 30, 2023)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO	Discharge Quantity (gallons)**	Amount Reaching State Waters (gallons)**	DEQ IR	Force Majeure Rationale or Stipulated Penalty
6/6/2023 2:45:00 PM	Shell Road and Hopewell Drive	Shell Road FM	St Juliens Creek via Deep Creek Canal	Chesapeake	Infrastructure	At approximately 2:45PM on 06/06/2023, HRSD Interceptors received a call from the City of Chesapeake that there was sewage on the side of the south bound lane in front of 920 Shell Road. HRSD dispatched a crew that was on site at approximately 3:30 PM. Crew confirmed sewage and that it was likely the HRSD 24-inch IFM under the shoulder of the road. Estimated flow rates at that time was 15 gpm. The spill was localized to the shoulder of the road and was flowing at a low rate to the storm inlet to the south.	3 hour(s) 45 minute(s)	The failure location is immediately upstream of the Deep Creek PRS and at 4:21PM on 06/06/2023 the PRS was activated to reduce pressures in the main. By 6:30 PM that evening, the flow had stopped, the road was dry and the ground next to the road was mostly dry. With the PRS keeping the leak undetectable, HRSD chose not to excavate on the pipe until HRSD had an effective plan and contingencies. The plans are still in development and HRSD tentatively expects to make a repair the evening of 06/15/2023. Deep Creek PRS will remain in operation until after the repair is completed.	3,400	3,400	SSORS #2023-T-106277	$1,250
6/23/2023 5:22:00 PM	720 Bayshore Lane	Bayshore Lane PS	Chesapeake Bay	Hampton	Capacity-Weather Related	Significant wet weather resulted in increased system flows. Bayshore Lane PS saw a maximum rainfall of 0.82” in 15 minutes (06/23/23 at 4:30 pm), with a total of 1.57” falling in 1 hour. Total rainfall for the rain event for this rain gauge was 3.82”.	3 hour(s) 38 minute(s)	Verified pump station operating properly and monitored the SSO. The area was cleaned of visible debris and solids.	3,460	3,460	SSORS #2023-T-106292	The HRSD service area experienced a 32-hour rainfall event that resulted in 1.42 inches of rainfall across the North Shore. The associated rain gauge of the overflow measured 3.82 inches; a 10yr RRI. As such, Force Majeure is asserted for this overflow.

Table 2. Detailed Listing of HRSD Treatment Plant Unusual Discharges

(April 1, 2023 to June 30, 2023)

Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Force Majeure Rationale Or Stipulated Penalty
4/3/2023	Nansemond	Contractor hit a 2 inch PVC NPW line while excavating.	15	NPW system was shut down and PVC line was repaired.	18000	9500	Non-Potable Water (NPW)	ground and storm drain	NPW
4/15/2023	Nansemond	Plant Operator secured the emergency generator required to run the final effluent pumps, causing the effluent wet well to fill up, and the effluent channel to overflow. This resulted in a spill of approximately 15,000 gallons onto the ground, none of which was able to be recovered.	40	Lead Operator started a different emergency generator, and began to run the effluent pumps lowering the wet well level and allowing the spill to stop.	15000	15000	Final Effluent (FNE)	ground	FNE
4/30/2023	Nansemond	On April 30th beginning at 22:00 Nansemond Plant had three residuals <0.50 mg/L in a row. These exceptions were due to a storm event that increased plant flows by ~20MGD, causing increased ammonia levels in the Contact Tank and the need to place additional contact tanks in service. This event ended 4/30 at 23:13. While troubleshooting the Sodium Hypochlorite feed issues at the contact tank, all flow was diverted to the effluent holding pond. The pond filled up and flow diverted back to the river causing the two in service effluent pumps to start up at the same time. These pumps pulled the effluent wet well down and turned off, starting a 30 minute cooldown timer on the pump motors which was unable to be bypassed. During this time the effluent channel overflowed and 50,000 gallons of final effluent spilled on the ground, none of which was able to be recovered. This event ended at 22:30. Nansemond TP rain gauge saw a maximum rainfall of 0.36” in 15 minutes (04/30/23 at 5:30 pm), with a total of 0.78” falling in 1	73	To resolve the low chlorine residuals, additional Sodium Hypochlorite pumps were placed into service and the 30 minute residual recovered. While waiting for the thirty minute pump cool down time to clear, operators started the pumps back up and adjusted the flow rate manually to not let the wet well empty again ceasing the effluent channel overflow	50000	50000	Final Effluent (FNE)	ground	FNE

Table 2. Detailed Listing of HRSD Treatment Plant Unusual Discharges

(April 1, 2023 to June 30, 2023)

Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Force Majeure Rationale Or Stipulated Penalty
		hour. Total rainfall for the rain event for this rain gauge was 1.60”.							
5/10/2023	Army Base	A fault in the West remote fire suppression pull stations to activate the cannons called for the system to go off and release the foam. This emptied the tank of all its contents. Once the foam tank was emptied the NPW that carries the AFFF to the cannons stayed spraying until plant personnel were able to secure it. Total Quantity Discharged: 200 AFFF/15,000 NPW gallons. Quantity Recovered 25 AFFF gallons. Quantity not recovered: 175 AFFF/ 15000 NPW gallons. A residual amount of AFFF and NPW was released on 5/11 (11:10) when the fire suppression cannons activated while contractors were removing a faulty pull switch. This release was ceased within seconds and was fully recovered.	68	Plant personnel began sand bagging the storm drains to contain the discharge and plant staff secured NPW flow to the cannons. On call staff were called to assist. Emergency clean up was provided by HEPACO to clean up any residual AFFF and NPW from the Methanol Facility, street, and the ground surrounding the area. Summit Fire Safety arrived to trouble shoot the fire suppression system pull station and were able to validate that was the cause of the issue. System was reset.	200	175	AFFF	storm drain/ Elizabeth river	$750
5/17/2023	Nansemond	RRF (Regional Residual Facility) Operator opened drain valve from RRF pad to Stormwater Pond, draining ~300 gallons of rainwater mixed with pumpstation residuals, none of which was able to be recovered.	0	Discovered as RRF Operator was closing the valve, Educated Operator on stormwater ponds and informed him of when we can and can't send water accumulated on the RRF pad to the stormwater pond.	300	300	Rainwater with Pumpstation residuals	Pond/creek	$750
6/5/2023	Nansemond	Contractor hit 2 inch non potable water line while digging	8	Non potable water line valve secured and line repaired. Used vac trailer to recover 1000 gallons.	1050	50	Non-Potable Water (NPW)	Ground	NPW

Table 2. Detailed Listing of HRSD Treatment Plant Unusual Discharges (April 1, 2023 to June 30, 2023)									
Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Force Majeure Rationale Or Stipulated Penalty
6/26/2023	Williamsburg	The outfall control cabinet lost power when a component in the automatic transfer switch (ATS) for the outfall valves failed. This ATS was designed to detect and switch between available power sources. Though power was available, it was not detected by the ATS and the outfall valve was automatically closed. Fully treated effluent flowed over the weir and was sent to the short outfall.	86	E&I removed the failed ATS component and rerouted the power supply directly to the valves.	675534	675534	Final Effluent (FNE)	James River	FNE

Note: NPW (non-potable water) is fully treated and chlorinated final effluent.

Appendix A. Post-Storm Synopses Reports

There were four (4) qualifying events this quarter.

Appendix B. Definitions

"Bypass" shall mean the intentional diversion of waste streams from any portion of a treatment facility, as defined by 40 C.F.R. § 122.41(m).

"HRSD SS System" or "HRSD Sanitary Sewer System" shall mean the wastewater collection and transmission systems, including all pipes, Force Mains, Gravity Sewer Lines, lift stations, Pumping Stations, Pressure Reducing Stations, manholes, and any other appurtenances thereto, which are owned or operated by HRSD as of the Effective Date of this Consent Decree, and which serve the Localities. It does not include the portions of the sewer system that serves the Middle Peninsula communities within King William County, King and Queen County, Middlesex County, and Mathews County.

"Non-potable water (NPW)" is fully treated and chlorinated final effluent.

"Prohibited Bypass" shall mean a Bypass within the meaning of 40 C.F.R § 122.41(m)(4).

"Sanitary Sewer Overflow" or "SSO" shall mean an overflow, spill, diversion, or release of wastewater from or caused by the Regional SS System. This term shall include: (i) discharges to waters of the State or United States from the Regional SS System and (ii) any release of wastewater from the Regional SS System to public or private property that does not reach waters of the United States or the State, including Building/Private Property Backups.

"Sanitary Sewer Discharge" or "SSD" shall mean any discharge to waters of the State or the United States from the HRSD SS System through a point source not authorized in any Permit.

Hampton Roads Sanitation District

Post-Storm Report

4/30/2023

HRSD
Cleaning wastewater every day for a better Bay.

DISCLAIMER:

About the information on this HRSD server

This report is intended to provide the HRSD regional community summary information about the HRSD system during select wet weather events/anomalies. The attached report contains a selection of *official* Interceptor and Treatment data, as well as other environmental and meteorological data provided through other services. In an effort to enhance the HRSD system, the attached products have been made accessible on this server and care must be taken when using such products as they are intended for informational and not operational, legal, or other purposes.

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Summary

On April 30th, there was an approximate 13-hour rainfall event that resulted in 9 sites on the North Shore and 3 sites on the South Shore that met a 1 to 5-year rainfall recurrence interval throughout the HRSD rain gauge network. There were scattered showers in the morning with heavier rain in the afternoon. Heavier rain also brought strong winds and a tornado in the area of Virginia Beach. The tornado was classified as an EF-3 with winds between 136 and 165 mph. It was the strongest tornado to ever hit the city of Virginia Beach and caused significant damage along its path (see Appendix D). North Shore sites averaged around 2.21 inches of rain while South Shore sites averaged around 1.87 inches. There was minimal impact on groundwater levels compared to April 2022. See Appendix C for the Historical Shallow Well comparison.

One HRSD interceptor weather-related overflow(s) were reported.

Four Locality interceptor weather-related overflow(s) were reported.

HRSD flow and pressure meters met data reliability requirements per the MOM program. For all pressure meters in the aggregate and all pressure-side flow meters in the aggregate for each treatment plant service area listed below, at least 90% reliable data was achieved, based on the duration of system response to this rainfall event. The data reliability for the gravity flow meters is not included in this synopsis.

- Duration of system response: See Table Below
- Aggregate flow meter validity: 92.68%
- Aggregate pressure meter validity: 99.25%

Currently, rainfall recurrence intervals are only analyzed for a maximum of 96-hours. Rainfall analysis begins after 0.1 inches of rain has occurred. A 72-hour dry period of less than 0.1 inches of rain is typically used to signify two separate events. However, if a site returns to "dry weather" conditions prior to the next rainfall that occurs within 72 hours of the previous event, it is also considered for separate analysis. See Appendix A for the Rainfall Total System Maps.

The current criteria for publishing a post-storm analysis are the following:

- One or more rain gauge sites meet a two-year or greater RRI (rainfall recurrence interval) and at least 50% of sites in any treatment plant service area receive one inch of rainfall or greater,
- A rain gauge site meets a five-year or greater RRI, or
- A weather-related SSO occurs.

Sanitary Sewer Overflows:

HRSD - North Shore

Location	Locality	Start Date
321 North Ave	Newport News	04/30/2023

Localities

Location	Locality	Start Date
115 Depot Street	James City	4/30/2023
5349 Rockingham Drive	James City	4/30/2023
174 Forest Heights Road	James City	4/30/2023
329 Cattail Ln	York	5/1/2023

Treatment Plant Data: ***(Data obtained from Telog Database)***
See Appendix B for HRSD Treatment Plant Flows

HRSD Treatment Plant Data
4/30/2023

North Shore				
Treatment Plant	Date of Peak Hourly Flow	Peak Hourly Flow (MGD)	Peak Hour	TPSA Total Rainfall Avg (in)
Boat Harbor	4/30/2023	34.93	22:00	2.27
James River	4/30/2023	36.84	19:00	2.06
Williamsburg	4/30/2023	31.63	14:00	1.78
York River	4/30/2023	26.58	19:00	1.76

HRSD Treatment Plant Data
4/30/2023

South Shore				
Treatment Plant	Date of Peak Hourly Flow	Peak Hourly Flow (MGD)	Peak Hour	TPSA Total Rainfall Avg (in)
Army Base	4/30/2023	20.49	19:00	1.27
Atlantic	4/30/2023	103.44	20:00	1.22
Nansemond	4/30/2023	51.33	22:00	1.73
VIP	4/30/2023	66.44	19:00	1.32

North Shore Table

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Boat Harbor Treatment Plant Service Area[1]		
Bayshore PS	2- to 5-year (1hr)	HAMP
Bridge Street Tide Gate	1- to 2-year (1hr)	HAMP
Boat Harbor	DNQ	NEWP
Copeland Park PS	DNQ	NEWP
Hampton PS 159	2-year (2hr)	HAMP
James River Treatment Plant Service Area[1]		
Hilton School PS	2- to 5-year (2hr)	NEWP
James River Main Flow (Influent)	DNQ	NEWP
Lee Hall PRS	DNQ	NEWP
Lucas Creek PS	DNQ	NEWP
Morrison PS	2-year (2hr)	NEWP
Williamsburg Treatment Plant Service Area[1]		
Ford's Colony	DNQ	JCSA
Fort Eustis PS	Disconnected	NEWP
Greensprings PS	DNQ	JCA
Solarex	DNQ	JCSA
Williamsburg Main Flow (Effluent)	DNQ	JCSA
Williamsburg PS	DNQ	WILL
York Skimino Hills PS	2-year (6hr)	YORK

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
York River Treatment Plant Service Area[1]		
Big Bethel PRS	1- to 2-year (1hr)	HAMP
Freeman PS	DNQ	HAMP
Gloucester Court House	DNQ	GLOU
Guinea Rd at Maryus Rd	2- to 5-year (6hr)	GLOU
Ordinary PCV	DNQ	GLOU
Poquoson PS 6	DNQ	POQ
Wolf Trappe PCV	DNQ	YORK
York Kiln Creek 1 PS	DNQ	YORK
York PS 15	DNQ	YORK
York River Main Flow (Influent)	Disconnected	YORK
York River Crossing (York River Rectifier)	2-year (1hr)	GLOU

Note:

1. Typical treatment plant service area.

North Shore

Weather:

Rainfall (HRSD Rainfall Gauges): *Recurrence intervals based on NOAA Atlas 14*

Newport News-Williamsburg International (PHF)

- Wind and Rainfall (daily total):

Date	Gust (max)	Sustained (max)	Sustained (avg)	Direction	Rainfall (in)
4/30/23	28 mph	20 mph	8 mph	SE	1.29

Tide:

- Yorktown USCG Training Center:
  - Storm Surge: An approximate 2-foot storm surge was observed.

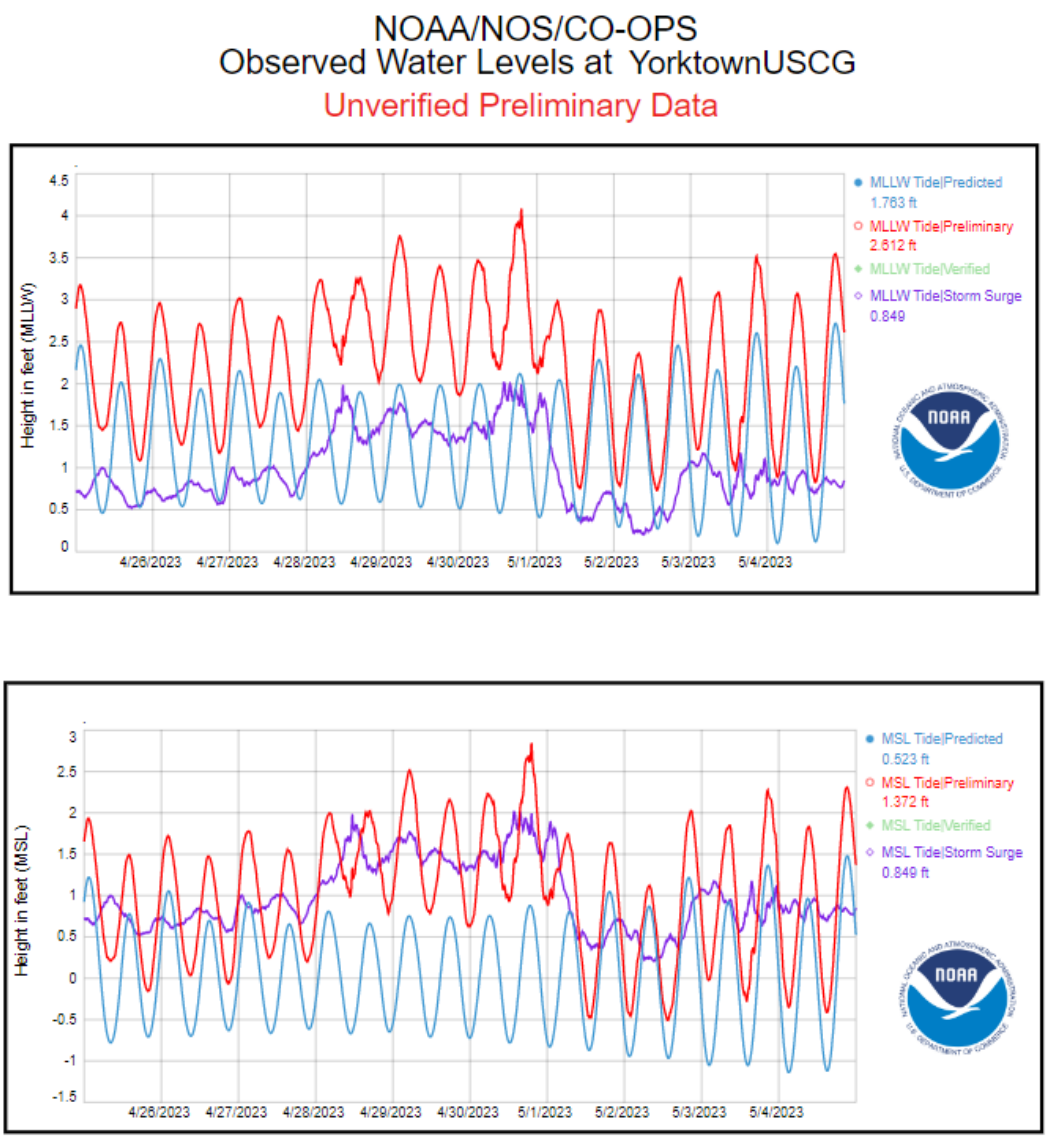


Figure 1. Preliminary data obtained from NOAA and a connection with Open Weather

- Sewells Point Tide Station:
  - Storm Surge: An approximate 1.86 foot storm surge was observed.

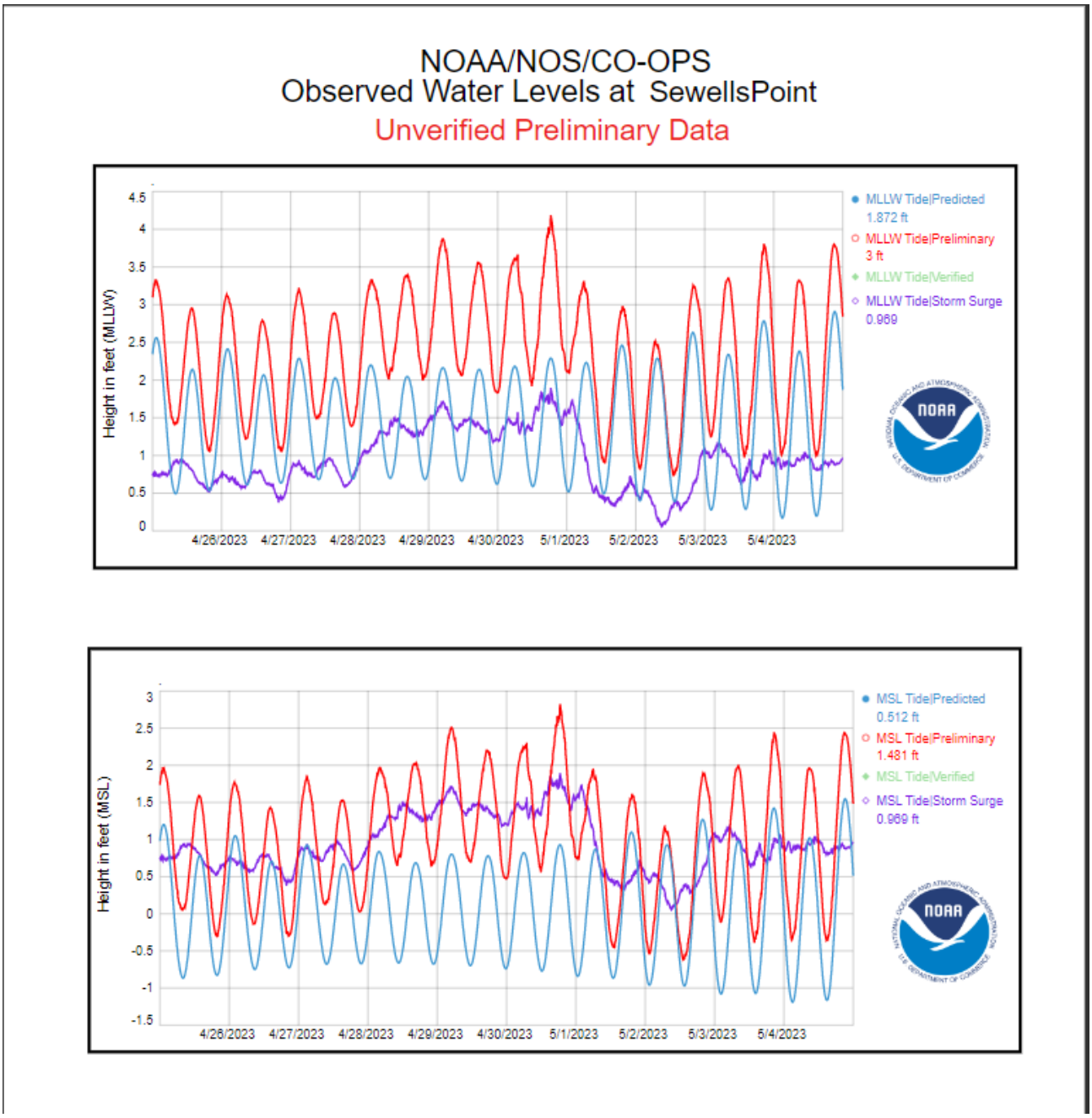


Figure 2. Preliminary data obtained from NOAA and a connection with Open Weather

South Shore Table

Rain Gauge Site	Peak Rainfall RI (Duration)	Jurisdiction
Army Base Treatment Plant Service Area[1]		
Bancker Rd (Dovercourt Discharge)	DNQ	NORF
Taussig Blvd PS	DNQ	NORF
Atlantic Treatment Plant Service Area[1]		
Callison at GB Locks	DNQ	CHES
Chesapeake PS 243	DNQ	CHES
Chesapeake PS 254	DNQ	CHES
Courthouse PRS	DNQ	VAB
Elbow Rd	DNQ	CHES
John B. Dey MLV-AT side	DNQ	VAB
Kempsville PRS	DNQ	VAB
Lagomar IFM at Atlantic TP	DNQ	VAB
Laskin Rd PRS	DNQ	VAB
Pine Tree PRS	DNQ	VAB
Shipps Corner PRS	DNQ	VAB
Ches-Liz Treatment Plant Service Area[1]		
Dozier's Corner PS	DNQ	CHES
Independence PRS	DNQ	VAB
Northampton Blvd at Wesleyan Dr	DNQ	NORF
Providence PRS	DNQ	VAB
Shore Dr @ Jack Frost	DNQ	CHES
Nansemond Treatment Plant Service Area[1]		
Bowers Hill PRS	5-year (1hr)	CHES
Cedar Lane PS	DNQ	PORT
Chesapeake PS 158	DNQ	CHES
Chesapeake PS 238	DNQ	CHES
Crittenden Rd_Chuckatuck Rectifier	1-year (2hr)	SUFF
Deep Creek PRS	1-year (1hr)	CHES
Lake Kilby WTP	DNQ	SUFF
Nansemond Main Flow (Effluent)	DNQ	SUFF
Pagan River Rectifier	DNQ	IOW
Pughsville PS	DNQ	SUFF
Route 337 PRS	DNQ	CHES
Smithfield High School	DNQ	IOW
Suffolk PS	DNQ	SUFF
Suffolk PS 81	DNQ	SUFF
Suffolk PS 87	DNQ	SUFF
Windsor Duke St PS	DNQ	IOW

Rain Gauge Site	Peak Rainfall RI (Duration)	Jurisdiction
VIP Treatment Plant Service Area[1]		
Elizabeth River Crossing_Eastern Branch	DNQ	NORF
Ferebee Avenue PS	DNQ	CHES
Luxembourg Avenue PS	DNQ	NORF
Rodman Ave PS	DNQ	PORT
Va Beach Blvd PS	DNQ	NORF
VIP Main Flow (Effluent)	DNQ	NORF

Note:

1. Typical treatment plant service area.

Norfolk International Airport (ORF)

- Wind and Rainfall (daily total):

Date	Gust (max)	Sustained (max)	Sustained (avg)	Direction	Rainfall (in)
4/30/2023	40 mph	29 mph	9 mph	SE	1.3

Tide:

- Sewells Point Tide Station:
  - Storm Surge: An approximate 1.4 foot storm surge was observed.

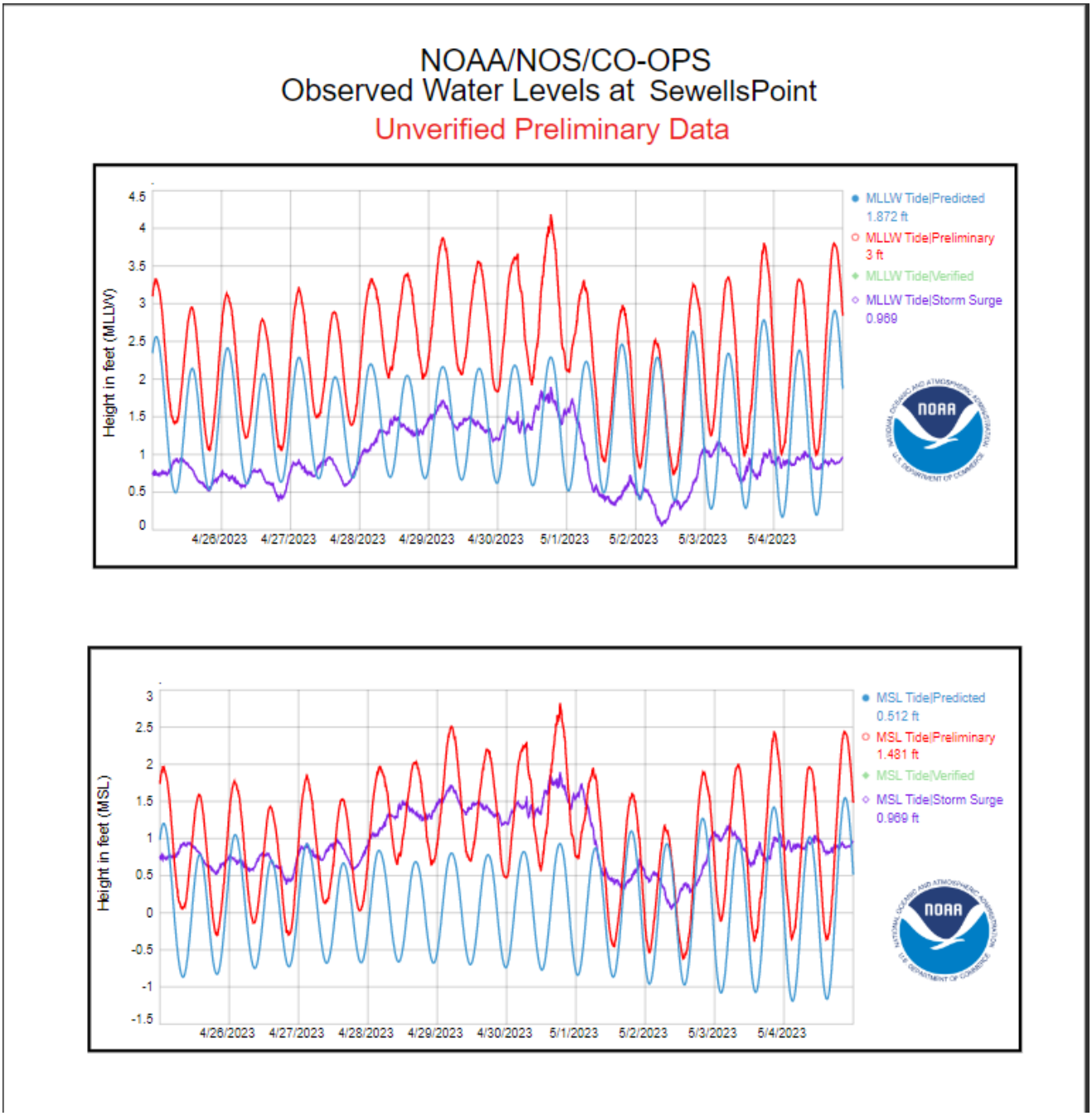


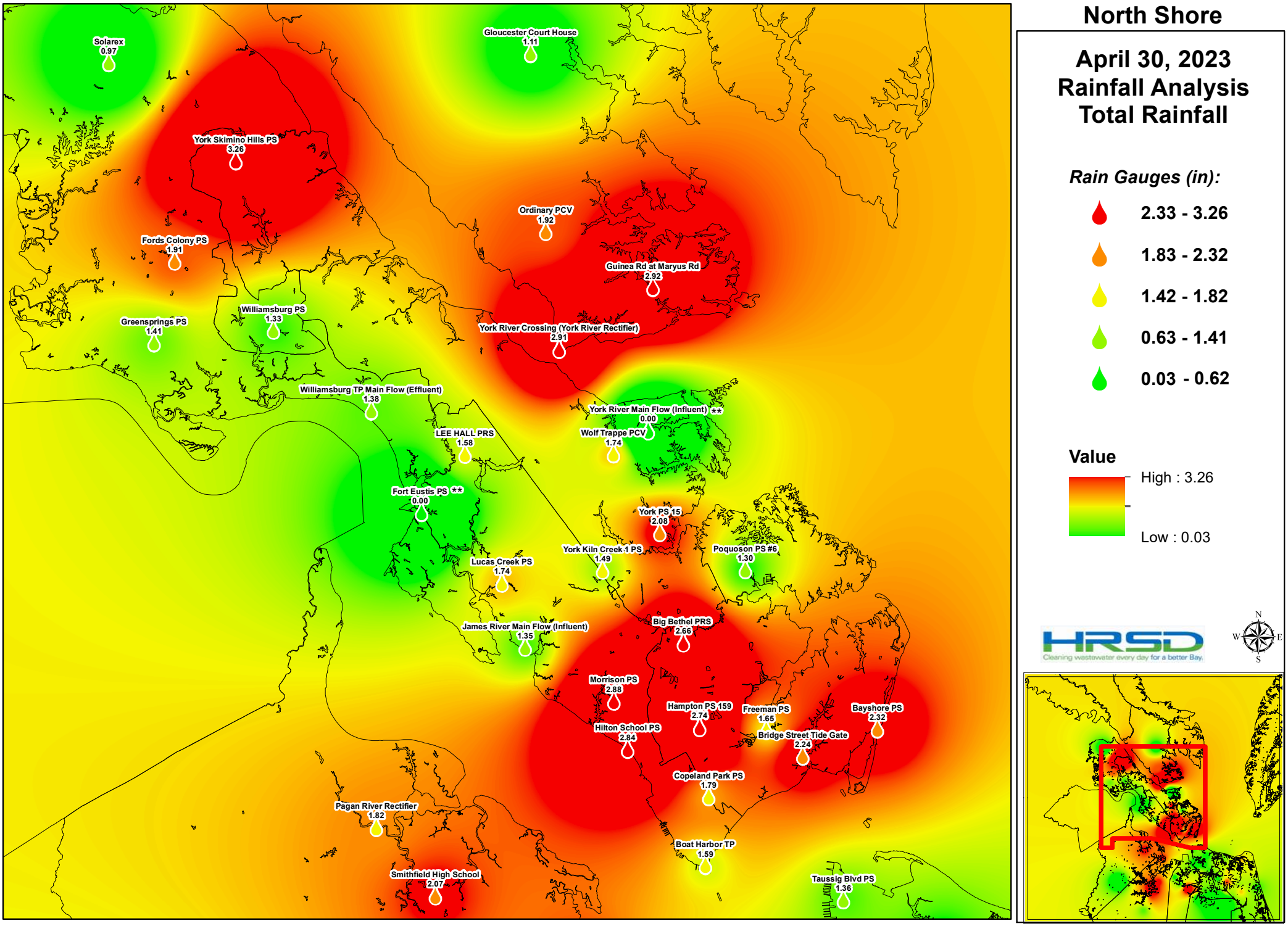
Figure 3. Preliminary data obtained from NOAA and a connection with Open Weather

Shallow Well Analysis:

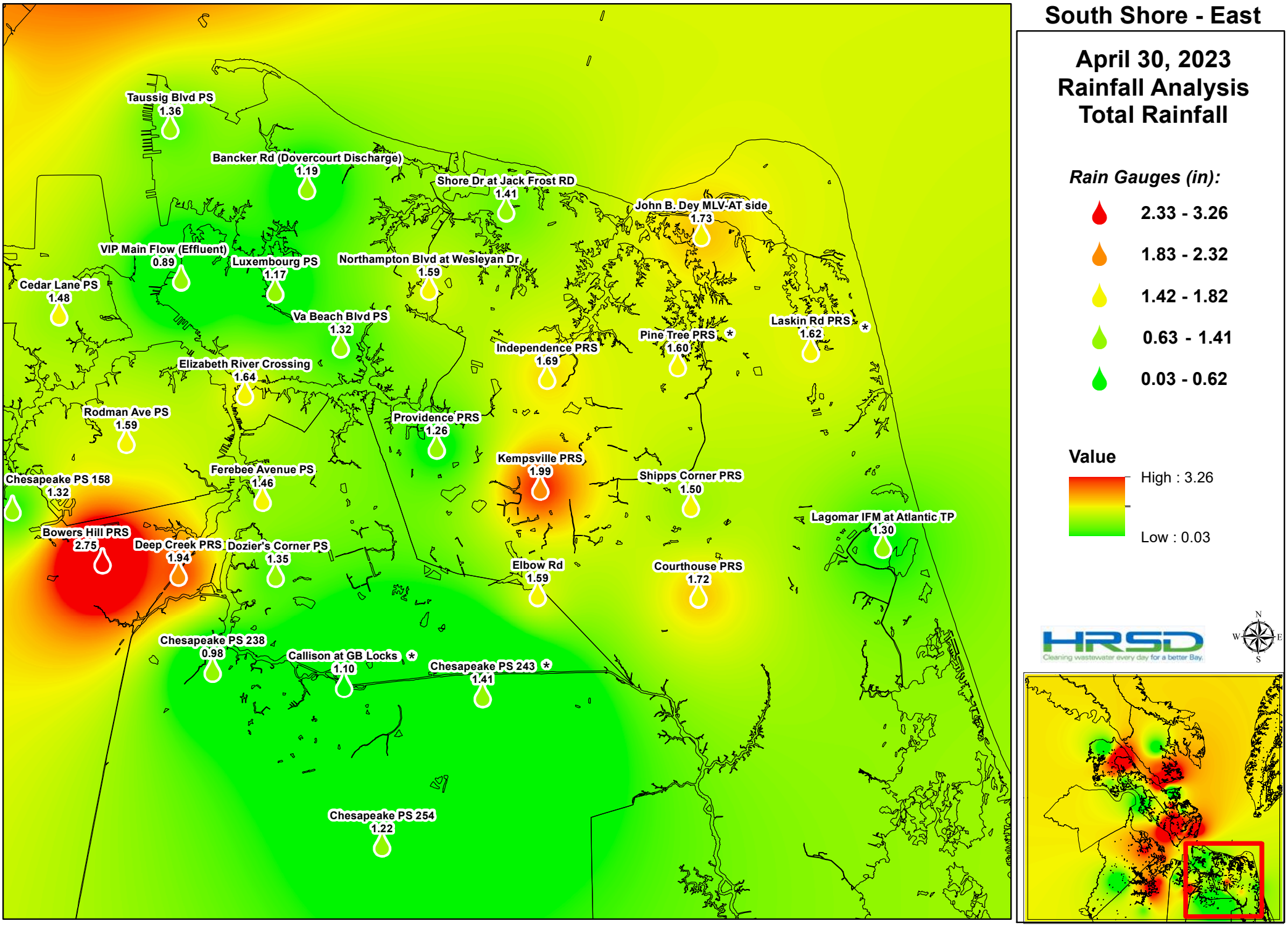
Shallow wells are located at/or near HRSD Pump Stations to measure groundwater levels. The water column is measured using a pressure transducer located near the bottom of the well. The installed sensor measures gauge pressure in inches of water. The Shallow Well_NAVD88 measurement referenced in Appendix C refers to the elevation (referenced as NAVD 88) of the sensor plus the gauge measurement in feet.

Appendix A

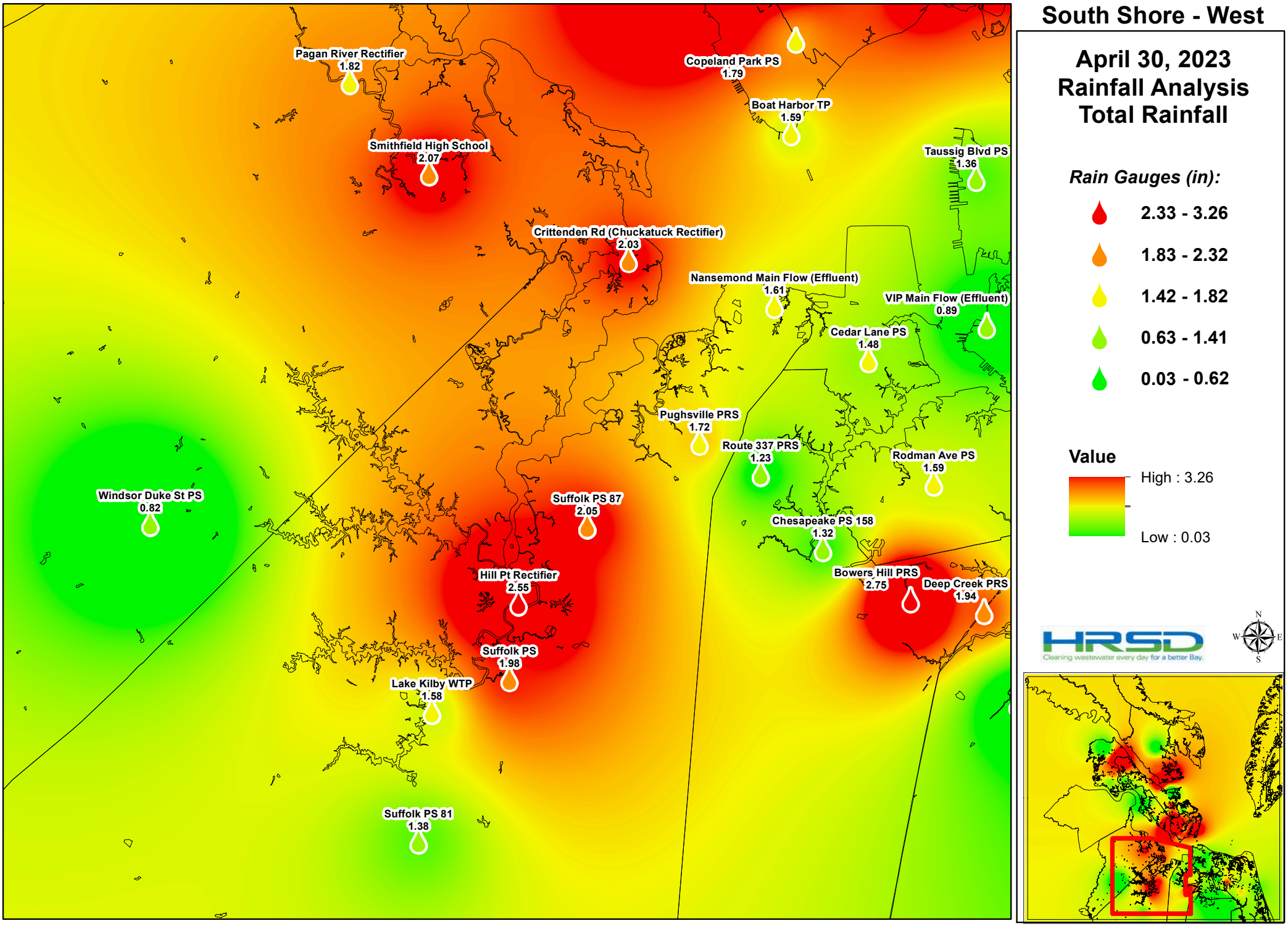
HRSD Rain Gauge Network
Rainfall Totals



*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. ** Rain Gauge disconnected during event.



*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. ** Rain Gauge disconnected during event.



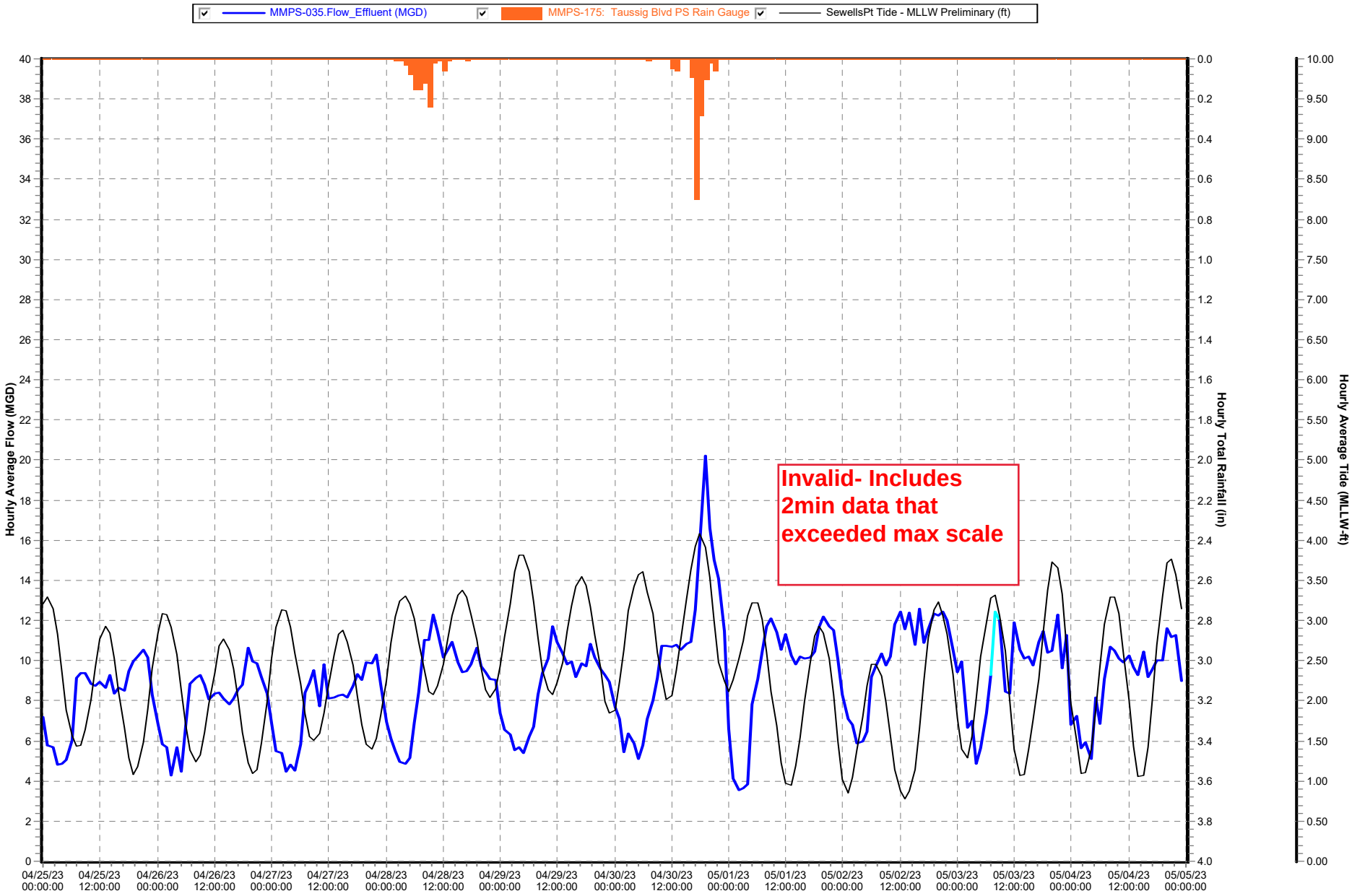
*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. ** Rain Gauge disconnected during event.

Appendix B

HRSD Treatment Plant Flows

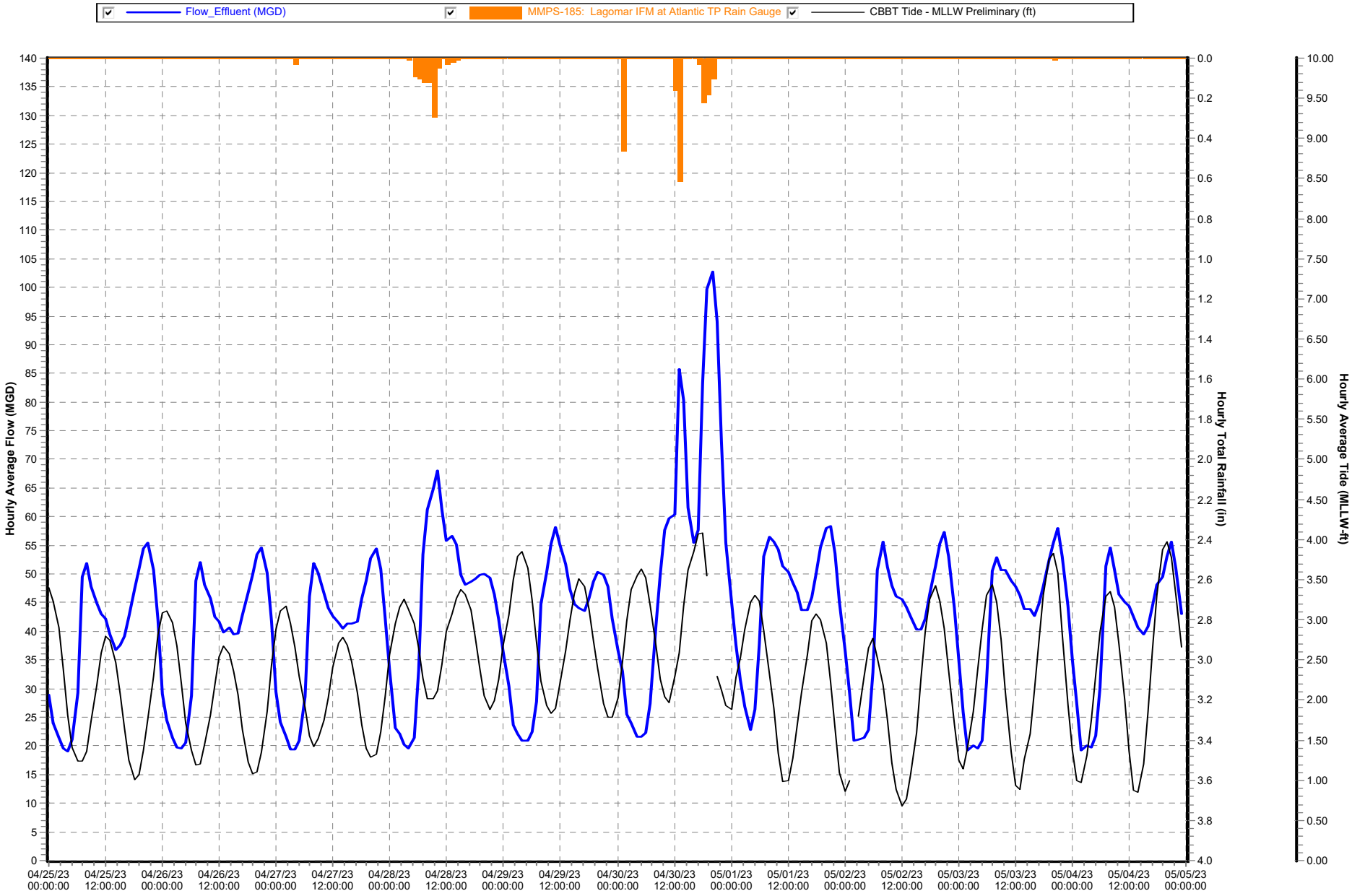
Army Base Treatment Plant

MMPS-035 (04/25/23 to 05/05/23)



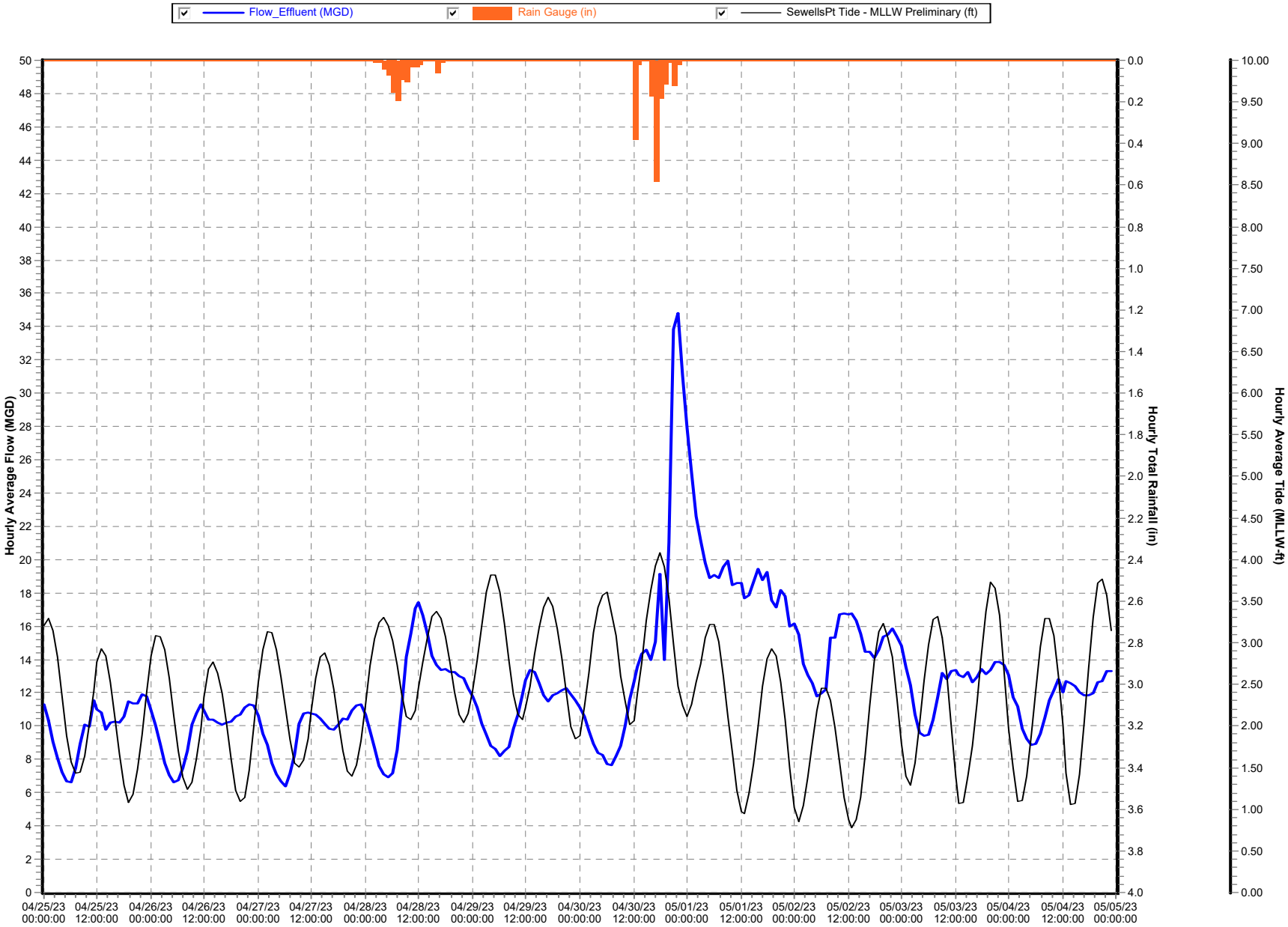
Atlantic Treatment Plant

MMPS-071 (04/25/23 to 05/05/23)



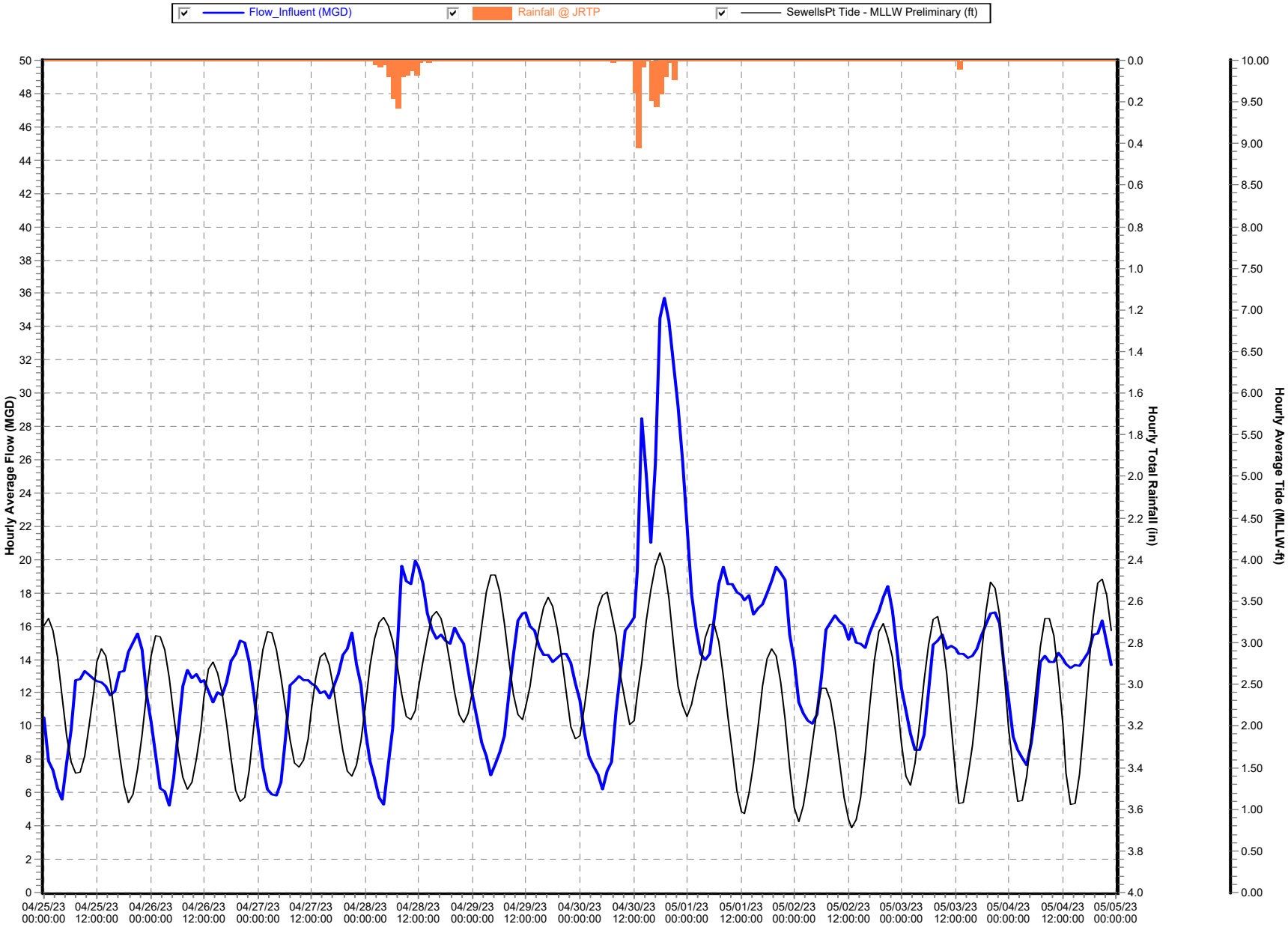
Boat Harbor Treatment Plant

MMPS-075 (04/25/23 to 05/05/23)



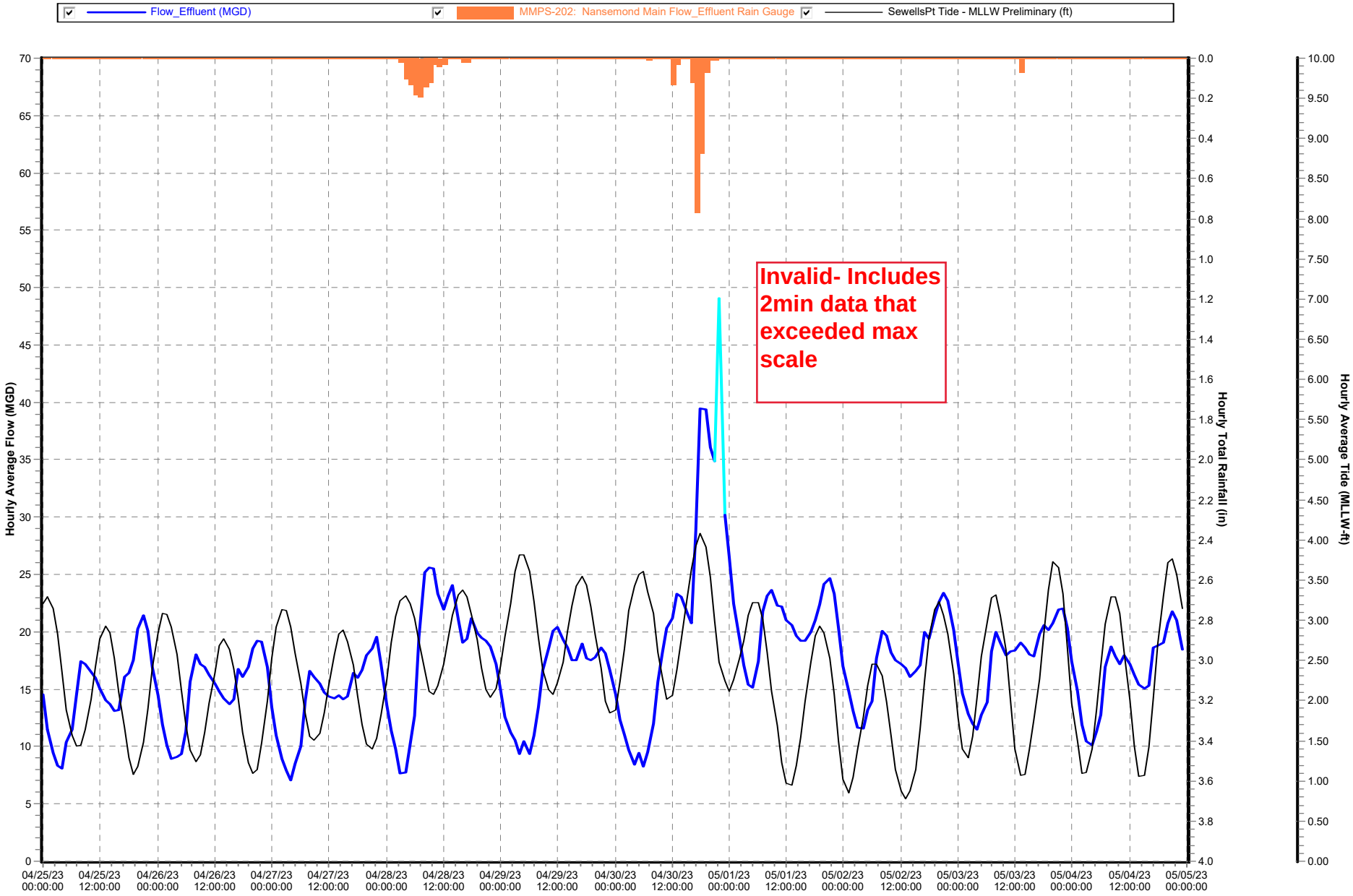
James River Treatment Plant

MMPS-184 (04/25/23 to 05/05/23)



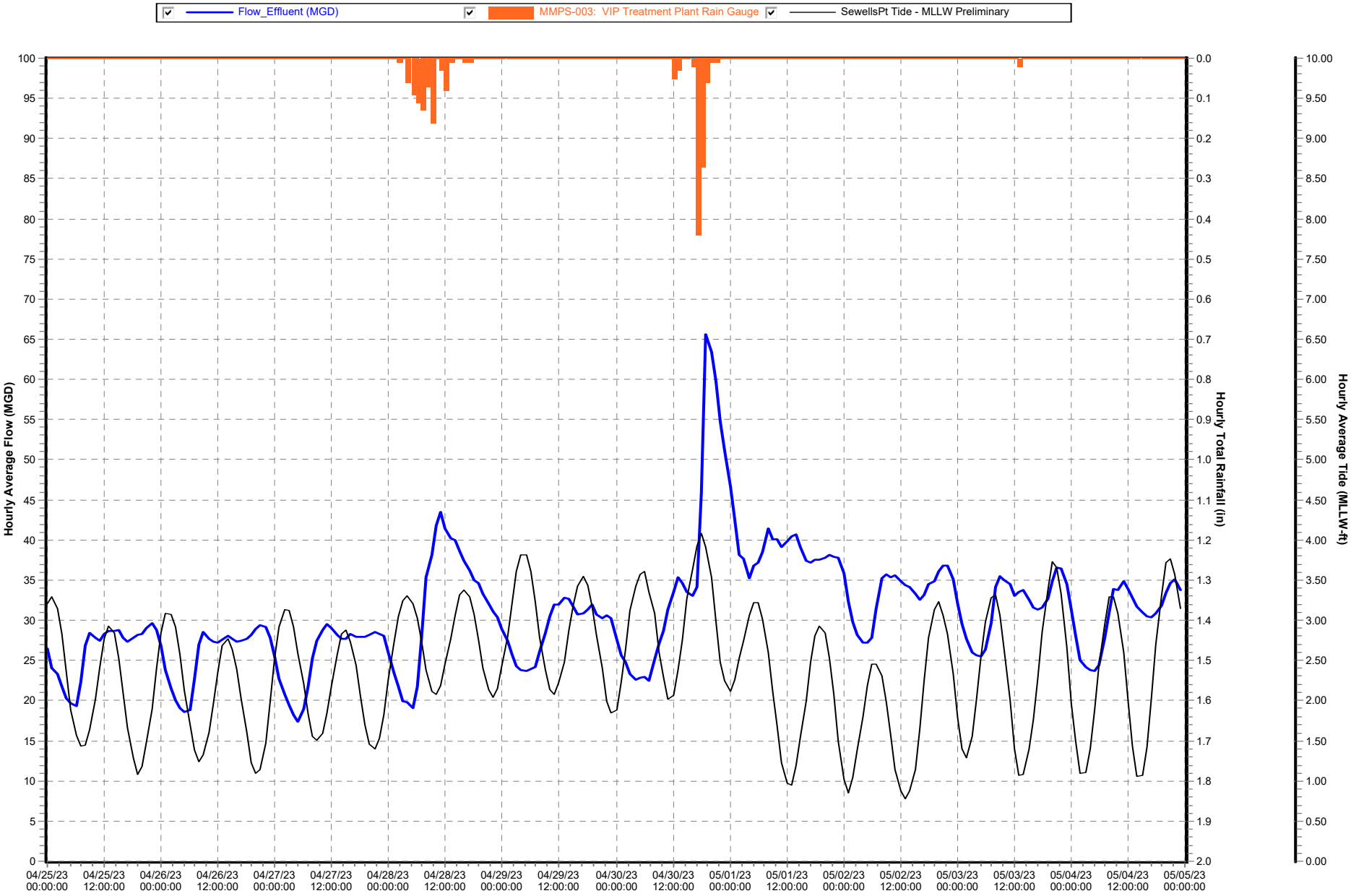
Nansemond Treatment Plant

MMPS-202 (04/25/23 to 05/05/23)



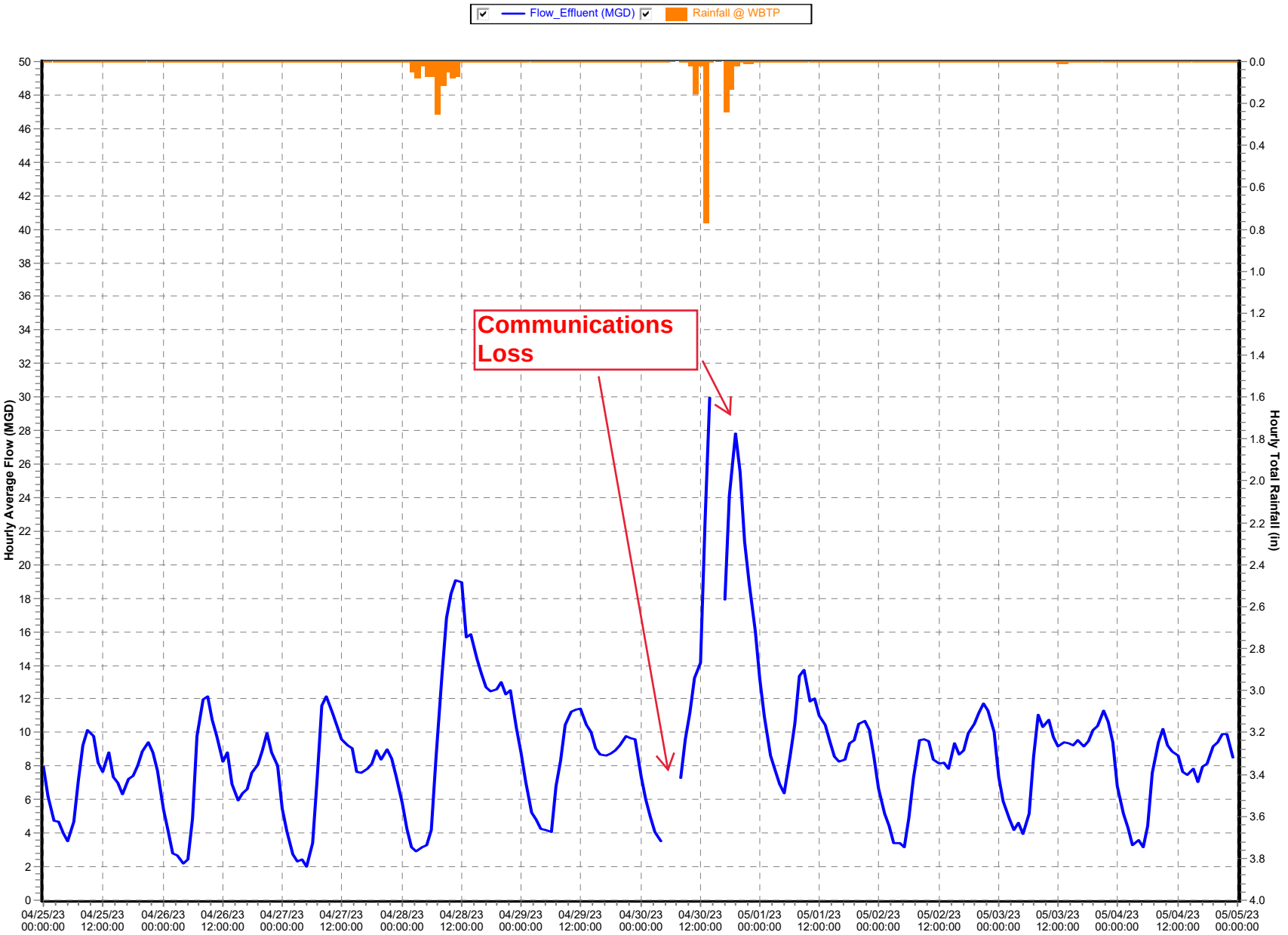
VIP Treatment Plant

MMPS-003 (04/25/23 to 05/05/23)



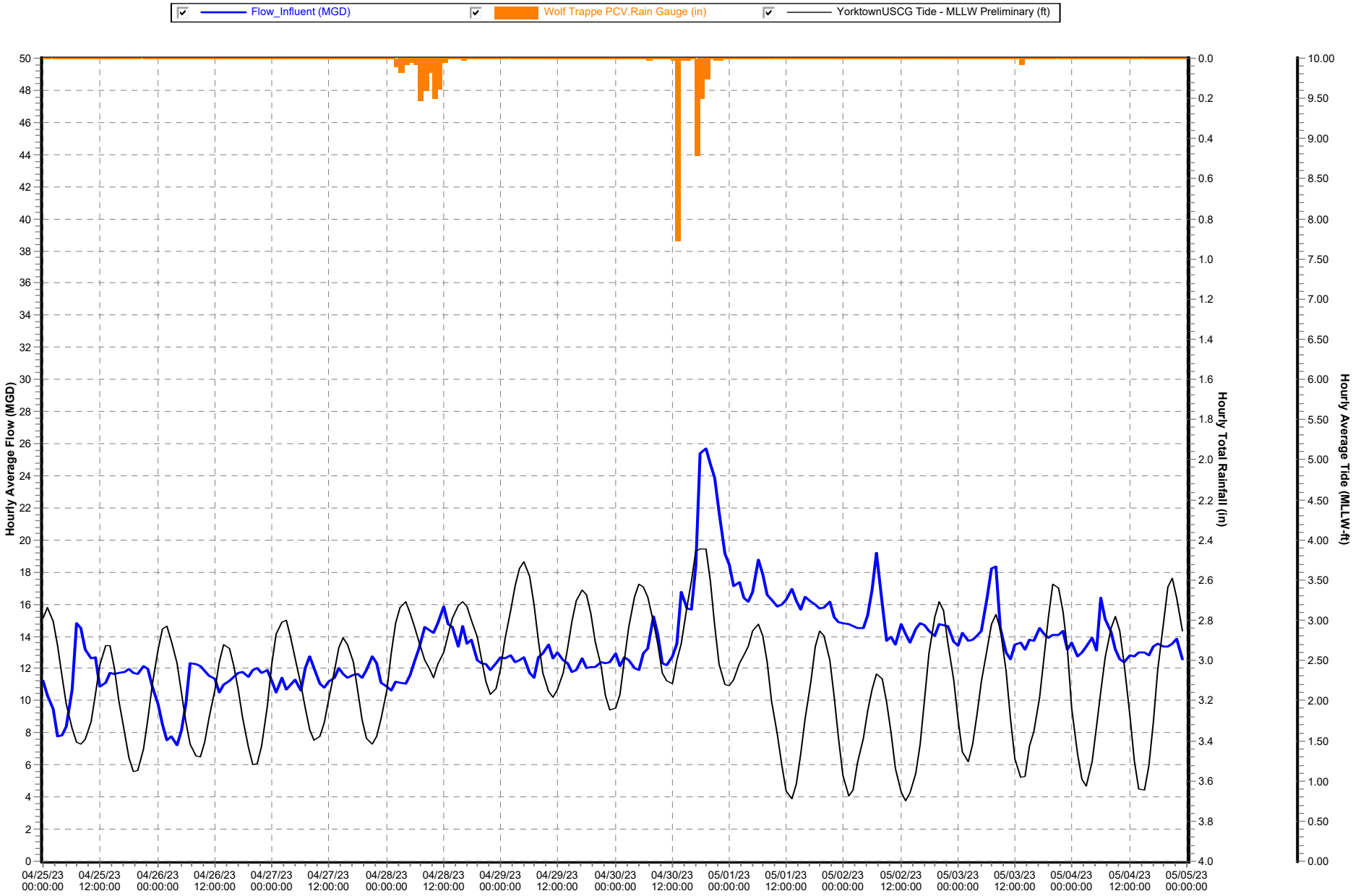
Williamsburg Treatment Plant

MMPS-222 (04/25/23 to 05/05/23)



York River Treatment Plant

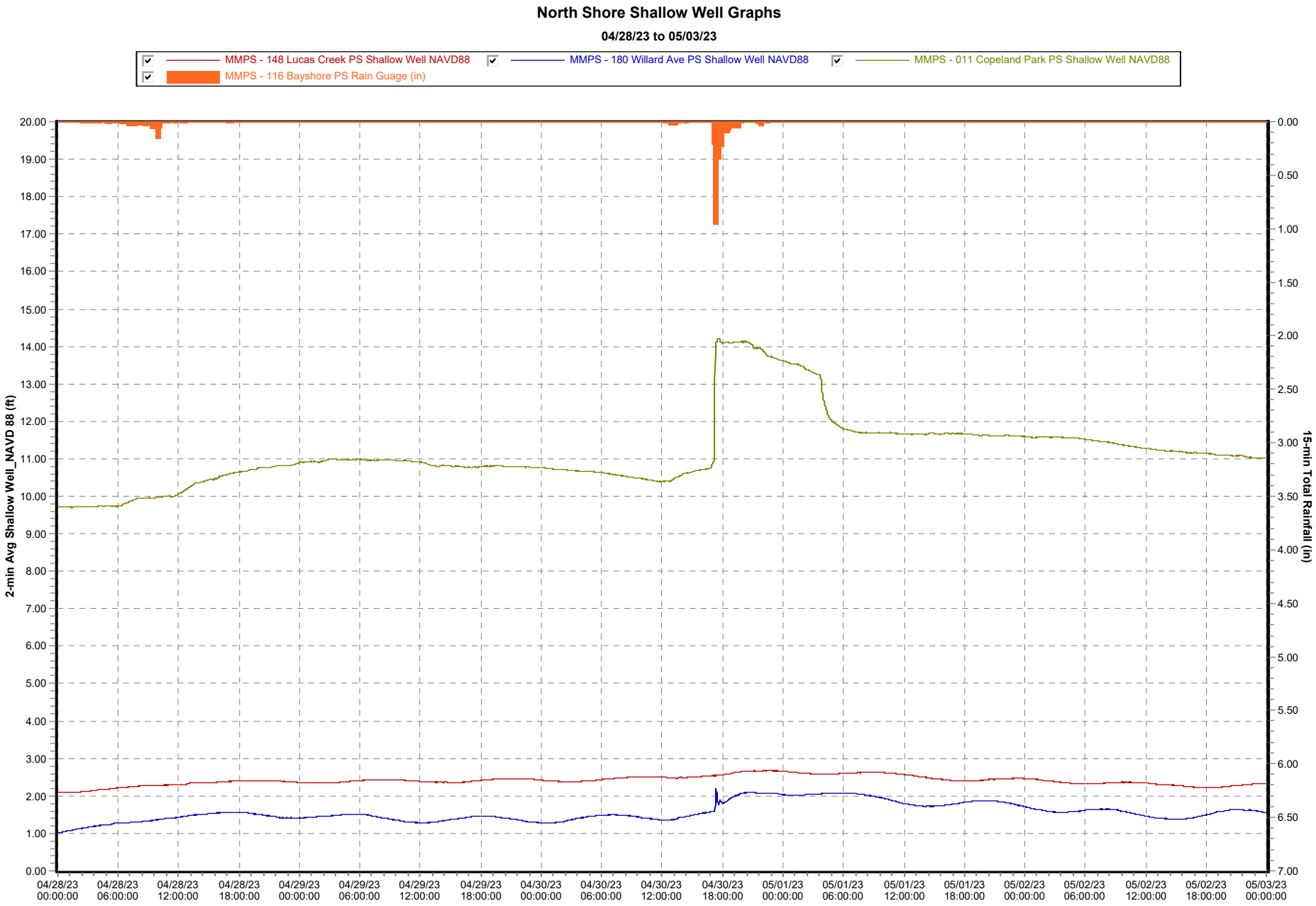
MMPS-235 (04/25/23 to 05/05/23)



Appendix C

Shallow Well Analysis

5 Day


North Shore Shallow Well Graphs
04/28/23 to 05/03/23
MMPS - 148 Lucas Creek PS Shallow Well NAVD88
MMPS - 180 Willard Ave PS Shallow Well NAVD88
MMPS - 011 Copeland Park PS Shallow Well NAVD88
MMPS - 116 Bayshore PS Rain Guage (in)
2-min Avg Shallow Well_NAVD 88 (ft)
15-min Total Rainfall (in)
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
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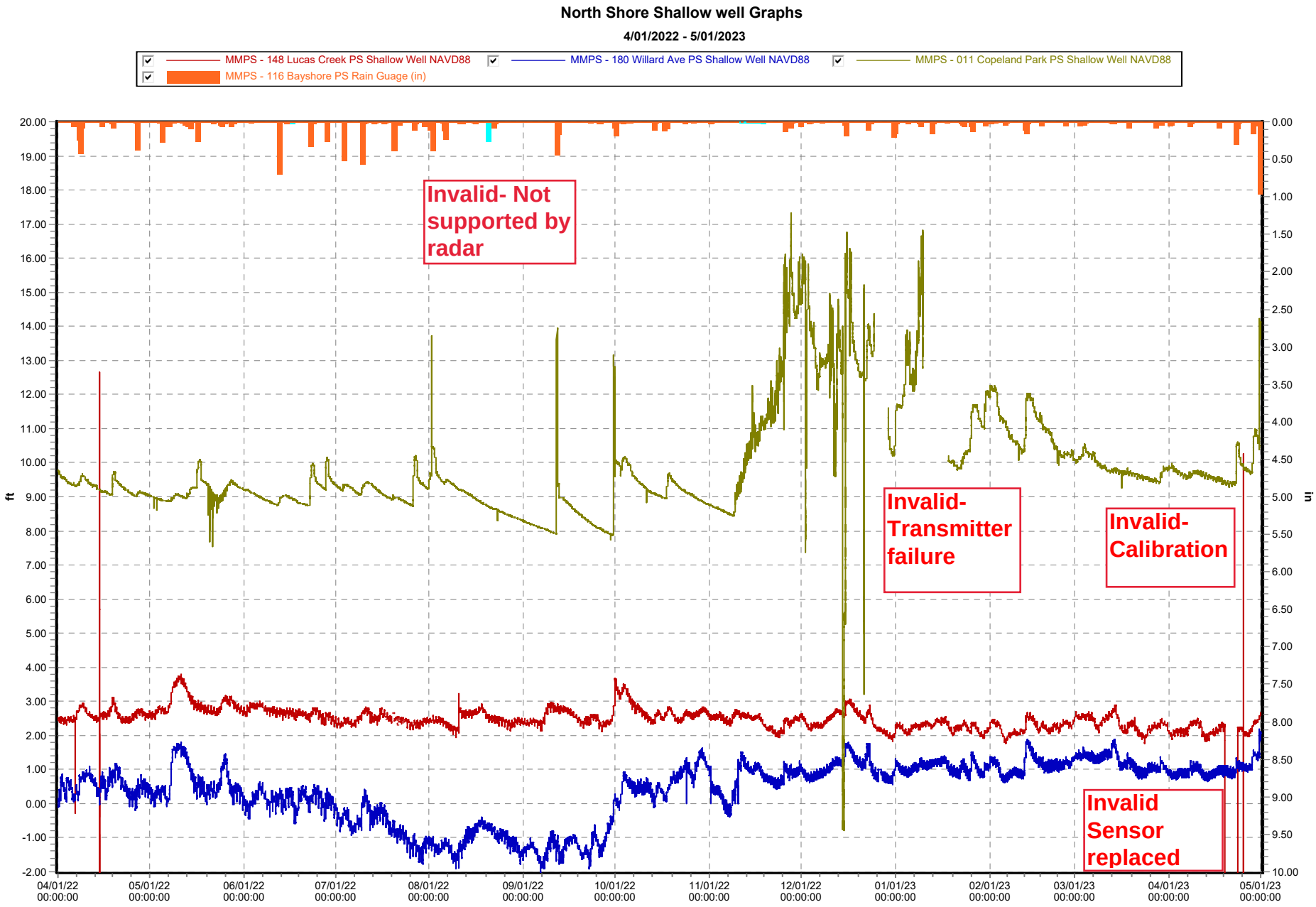
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.00
6.50
7.00
04/28/23 00:00:00
04/28/23 06:00:00
04/28/23 12:00:00
04/28/23 18:00:00
04/29/23 00:00:00
04/29/23 06:00:00
04/29/23 12:00:00
04/29/23 18:00:00
04/30/23 00:00:00
04/30/23 06:00:00
04/30/23 12:00:00
04/30/23 18:00:00
05/01/23 00:00:00
05/01/23 06:00:00
05/01/23 12:00:00
05/01/23 18:00:00
05/02/23 00:00:00
05/02/23 06:00:00
05/02/23 12:00:00
05/02/23 18:00:00
05/03/23 00:00:00

1 Year


North Shore Shallow well Graphs
4/01/2022 - 5/01/2023
MMPS - 148 Lucas Creek PS Shallow Well NAVD88
MMPS - 180 Willard Ave PS Shallow Well NAVD88
MMPS - 011 Copeland Park PS Shallow Well NAVD88
MMPS - 116 Bayshore PS Rain Guage (in)
Invalid- Not supported by radar
Invalid- Transmitter failure
Invalid- Calibration
Invalid Sensor replaced
ft
in
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
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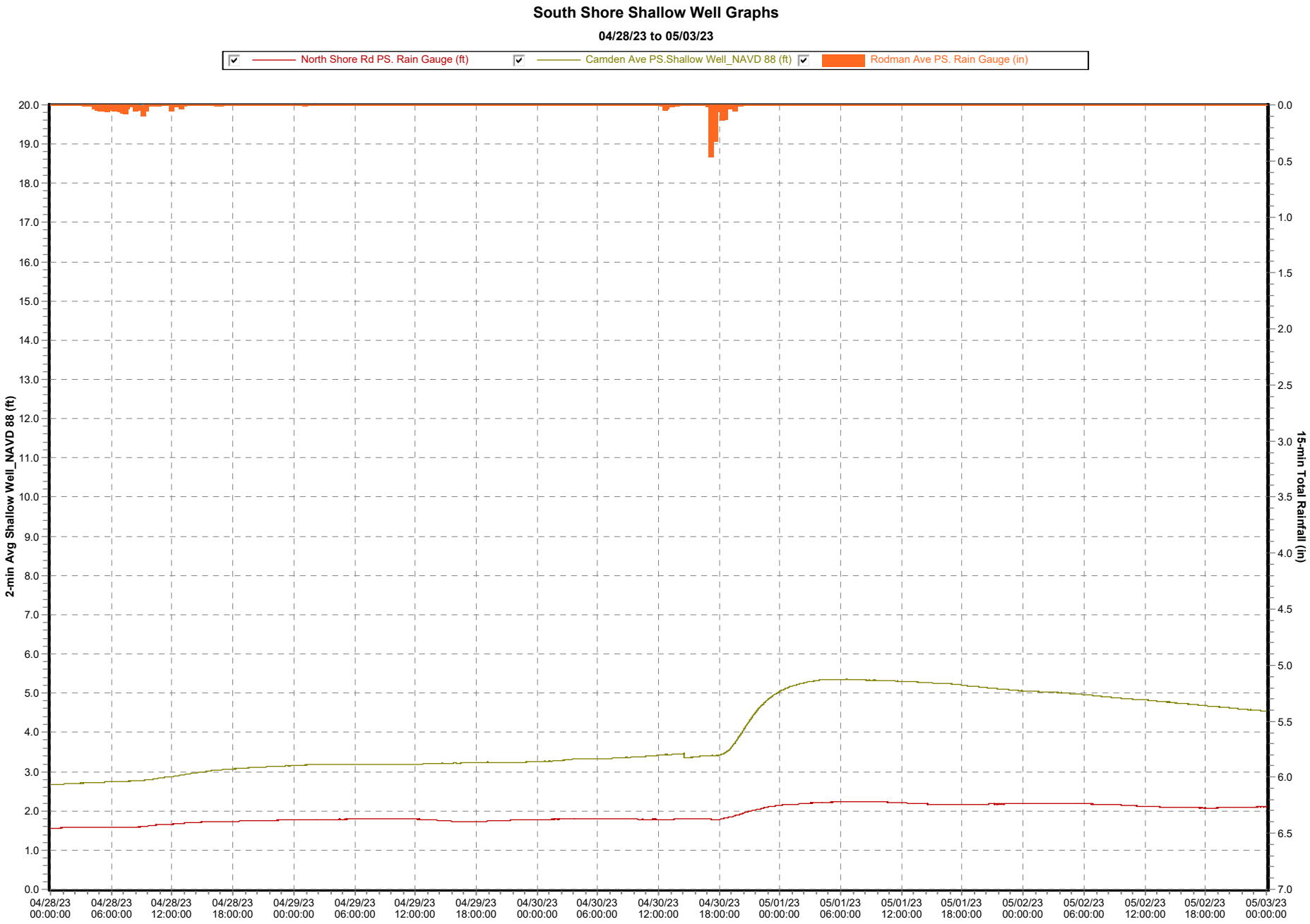
6.00
6.50
7.00
7.50
8.00
8.50
9.00
9.50
10.00
04/01/22 00:00:00
05/01/22 00:00:00
06/01/22 00:00:00
07/01/22 00:00:00
08/01/22 00:00:00
09/01/22 00:00:00
10/01/22 00:00:00
11/01/22 00:00:00
12/01/22 00:00:00
01/01/23 00:00:00
02/01/23 00:00:00
03/01/23 00:00:00
04/01/23 00:00:00
05/01/23 00:00:00

5 Day


South Shore Shallow Well Graphs
04/28/23 to 05/03/23
North Shore Rd PS. Rain Gauge (ft)
Camden Ave PS.Shallow Well_NAVD 88 (ft)
Rodman Ave PS. Rain Gauge (in)
2-min Avg Shallow Well_NAVD 88 (ft)
15-min Total Rainfall (in)
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
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0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
04/28/23 00:00:00
04/28/23 06:00:00
04/28/23 12:00:00
04/28/23 18:00:00
04/29/23 00:00:00
04/29/23 06:00:00
04/29/23 12:00:00
04/29/23 18:00:00
04/30/23 00:00:00
04/30/23 06:00:00
04/30/23 12:00:00
04/30/23 18:00:00
05/01/23 00:00:00
05/01/23 06:00:00
05/01/23 12:00:00
05/01/23 18:00:00
05/02/23 00:00:00
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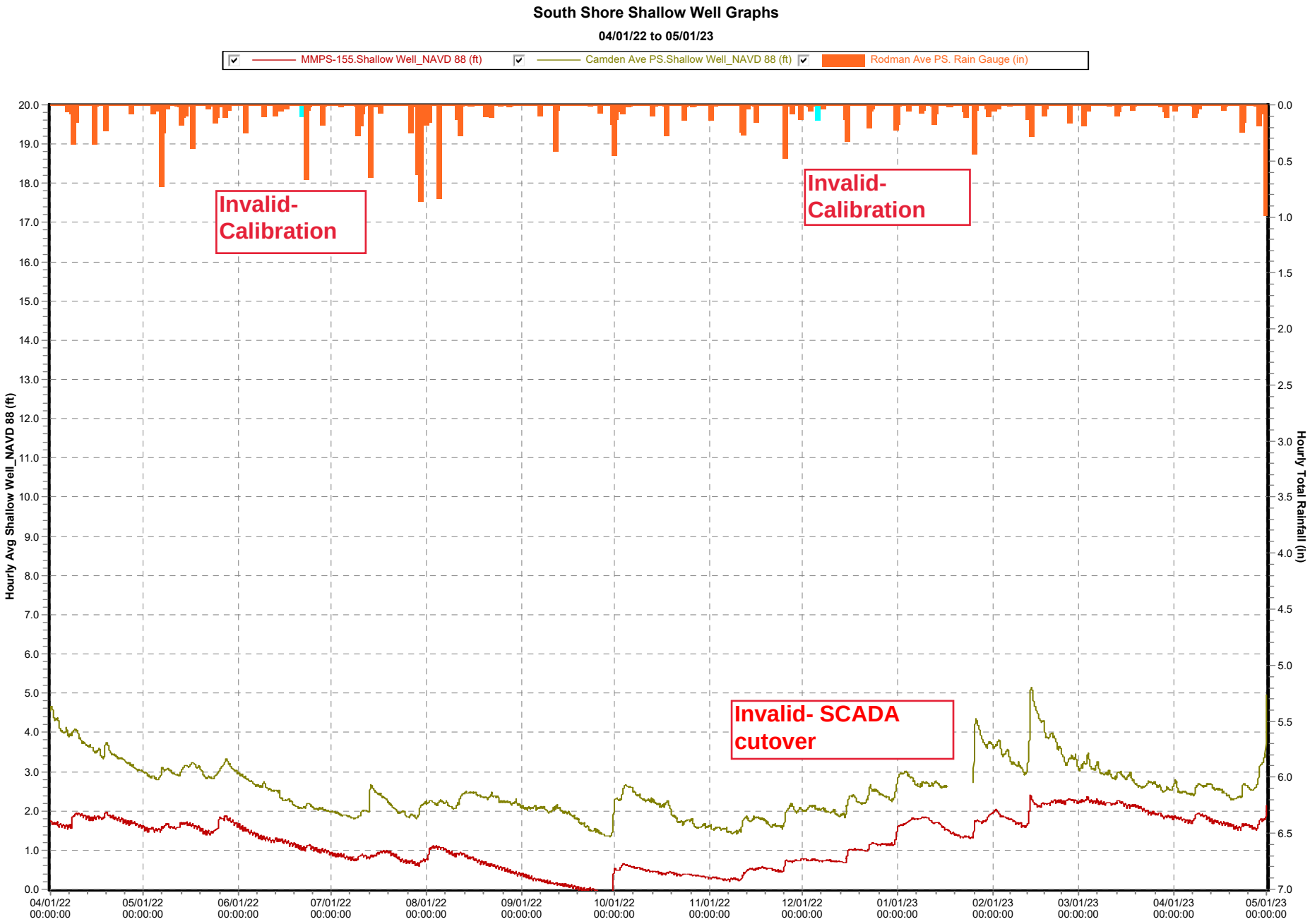
05/02/23 18:00:00
05/03/23 00:00:00

1 Year


South Shore Shallow Well Graphs
04/01/22 to 05/01/23
MMPS-155.Shallow Well_NAVD 88 (ft)
Camden Ave PS.Shallow Well_NAVD 88 (ft)
Rodman Ave PS. Rain Gauge (in)
Invalid- Calibration
Invalid- Calibration
Invalid- SCADA cutover
Hourly Avg Shallow Well_NAVD 88 (ft)
Hourly Total Rainfall (in)
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
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1.0
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2.0
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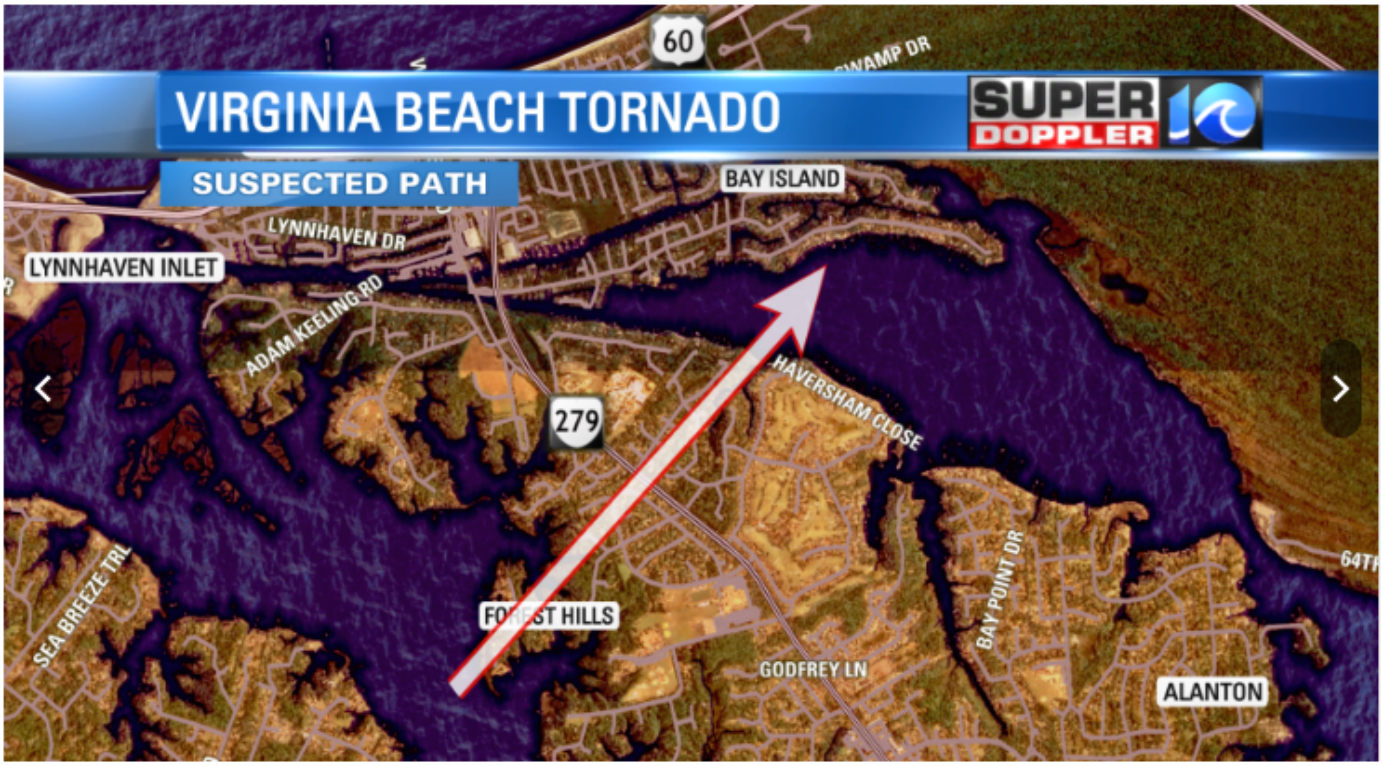
5.5
6.0
6.5
7.0
04/01/22 00:00:00
05/01/22 00:00:00
06/01/22 00:00:00
07/01/22 00:00:00
08/01/22 00:00:00
09/01/22 00:00:00
10/01/22 00:00:00
11/01/22 00:00:00
12/01/22 00:00:00
01/01/23 00:00:00
02/01/23 00:00:00
03/01/23 00:00:00
04/01/23 00:00:00
05/01/23 00:00:00

Appendix D

Tornado Path


VIRGINIA BEACH TORNADO
SUPER DOPPLER 10
SUSPECTED PATH
BAY ISLAND
LYNNHAVEN DR
LYNNHAVEN INLET
ADAM KEELING RD
60
279
HAVERSHAM CLOSE
SEA BREEZE TRL
FOREST HILLS
GODFREY LN
BAY POINT DR
ALANTON

Hampton Roads Sanitation District

Post-Storm Report

6/20/2023 – 6/21/2023

HRSD
Cleaning wastewater every day for a better Bay.

DISCLAIMER:

About the information on this HRSD server

This report is intended to provide the HRSD regional community summary information about the HRSD system during select wet weather events/anomalies. The attached report contains a selection of *official* Interceptor and Treatment data, as well as other environmental and meteorological data provided through other services. In an effort to enhance the HRSD system, the attached products have been made accessible on this server and care must be taken when using such products as they are intended for informational and not operational, legal, or other purposes.

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Summary

From June 20th through June 21st, there was an approximate 40-hour rainfall event that resulted in 7 sites on the North Shore and 0 sites on the South Shore that met a 1 to 5-year rainfall recurrence interval throughout the HRSD rain gauge network. There were periods of scattered showers throughout the day with occasional gusts of 45mph. An area of low pressure to the west continued to pump moisture into the area throughout the week. North Shore sites averaged around 1.94 inches of rain while South Shore sites averaged around .73 inches. There was minimal impact on groundwater levels compared to June 2022. See Appendix C for the Historical Shallow Well comparison. This report will be for North Shore only

No HRSD interceptor weather-related overflow(s) were reported.

One Locality interceptor weather-related overflow(s) were reported.

HRSD flow and pressure meters met data reliability requirements per the MOM program. For all pressure meters in the aggregate and all pressure-side flow meters in the aggregate for each treatment plant service area listed below, at least 90% reliable data was achieved, based on the duration of system response to this rainfall event. The data reliability for the gravity flow meters is not included in this synopsis.

- Duration of system response: See Table Below
- Aggregate flow meter validity: 94.50%
- Aggregate pressure meter validity: 97.60%

Currently, rainfall recurrence intervals are only analyzed for a maximum of 96-hours. Rainfall analysis begins after 0.1 inches of rain has occurred. A 72-hour dry period of less than 0.1 inches of rain is typically used to signify two separate events. However, if a site returns to "dry weather" conditions prior to the next rainfall that occurs within 72 hours of the previous event, it is also considered for separate analysis. See Appendix A for the Rainfall Total System Maps.

The current criteria for publishing a post-storm analysis are the following:

- One or more rain gauge sites meet a two-year or greater RRI (rainfall recurrence interval) and at least 50% of sites in any treatment plant service area receive one inch of rainfall or greater,
- A rain gauge site meets a five-year or greater RRI, or
- A weather-related SSO occurs.

Sanitary Sewer Overflows:

Localities

Location	Locality	Start Date
115 Depot Street	James City	6/21/2023

Treatment Plant Data: *(Data obtained from Telog Database)*
See Appendix B for HRSD Treatment Plant Flows

HRSD Treatment Plant Data
6/20/2023 – 6/21/2023

North Shore				
Treatment Plant	**Date of Peak Hourly Flow**	**Peak Hourly Flow (MGD)**	**Peak Hour**	**TPSA Total Rainfall Avg (in)**
Boat Harbor	6/20/2023	11.12	15:00	0.09
	6/21/2023	17.87	16:00	1.17
James River	6/20/2023	17.10	17:00	0.46
	6/21/2023	28.53	7:00	1.45
Williamsburg	6/20/2023	11.69	19:00	0.26
	6/21/2023	31.26	8:00	2.17
York River	6/20/2023	13.81	13:00	0.41
	6/21/2023	21.47	6:00	1.76

North Shore

Weather:

Rainfall (HRSD Rainfall Gauges): *Recurrence intervals based on NOAA Atlas 14*

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Boat Harbor Treatment Plant Service Area[1]		
Bayshore PS	DNQ	HAMP
Bridge Street Tide Gate	DNQ	HAMP
Boat Harbor	DNQ	NEWP
Copeland Park PS	DNQ	NEWP
Hampton PS 159	DNQ	HAMP
James River Treatment Plant Service Area[1]		
Hilton School PS	DNQ	NEWP
James River Main Flow (Influent)	DNQ	NEWP
Lee Hall PRS	Invalid	NEWP
Lucas Creek PS	1-year (36hr)	NEWP
Morrison PS	DNQ	NEWP
Williamsburg Treatment Plant Service Area[1]		
Ford's Colony	2-year (6hr)	JCSA
Fort Eustis PS	DNQ	NEWP
Greensprings PS	Invalid	JCA
Solarex	2- to 5-year (2hr)	JCSA
Williamsburg Main Flow (Effluent)	DNQ	JCSA
Williamsburg PS	1-year (3hr)	WILL
York Skimino Hills PS	Invalid	YORK
York River Treatment Plant Service Area[1]		
Big Bethel PRS	DNQ	HAMP
Freeman PS	DNQ	HAMP
Gloucester Court House	1-year (3hr)	GLOU
Guinea Rd at Maryus Rd	DNQ	GLOU
Ordinary PCV	1- to 2-year (3hr)	GLOU
Poquoson PS 6	DNQ	POQ
Wolf Trappe PCV	DNQ	YORK
York Kiln Creek 1 PS	Invalid	YORK
York PS 15	DNQ	YORK
York River Main Flow (Influent)	Disconnected	YORK
York River Crossing (York River Rectifier)	1-year (3hr)	GLOU

Note:

1. Typical treatment plant service area.

Newport News-Williamsburg International (PHF)

- Wind and Rainfall (daily total):

Date	Gust (max)	Sustained (max)	Sustained (avg)	Direction	Rainfall (in)
6/20/23	31 mph	22 mph	12 mph	NE	0.67
6/21/23	43 mph	27 mph	16 mph	NE	1.73

Tide:

- Yorktown USCG Training Center:
  - Storm Surge: An approximate 3.4-foot storm surge was observed.

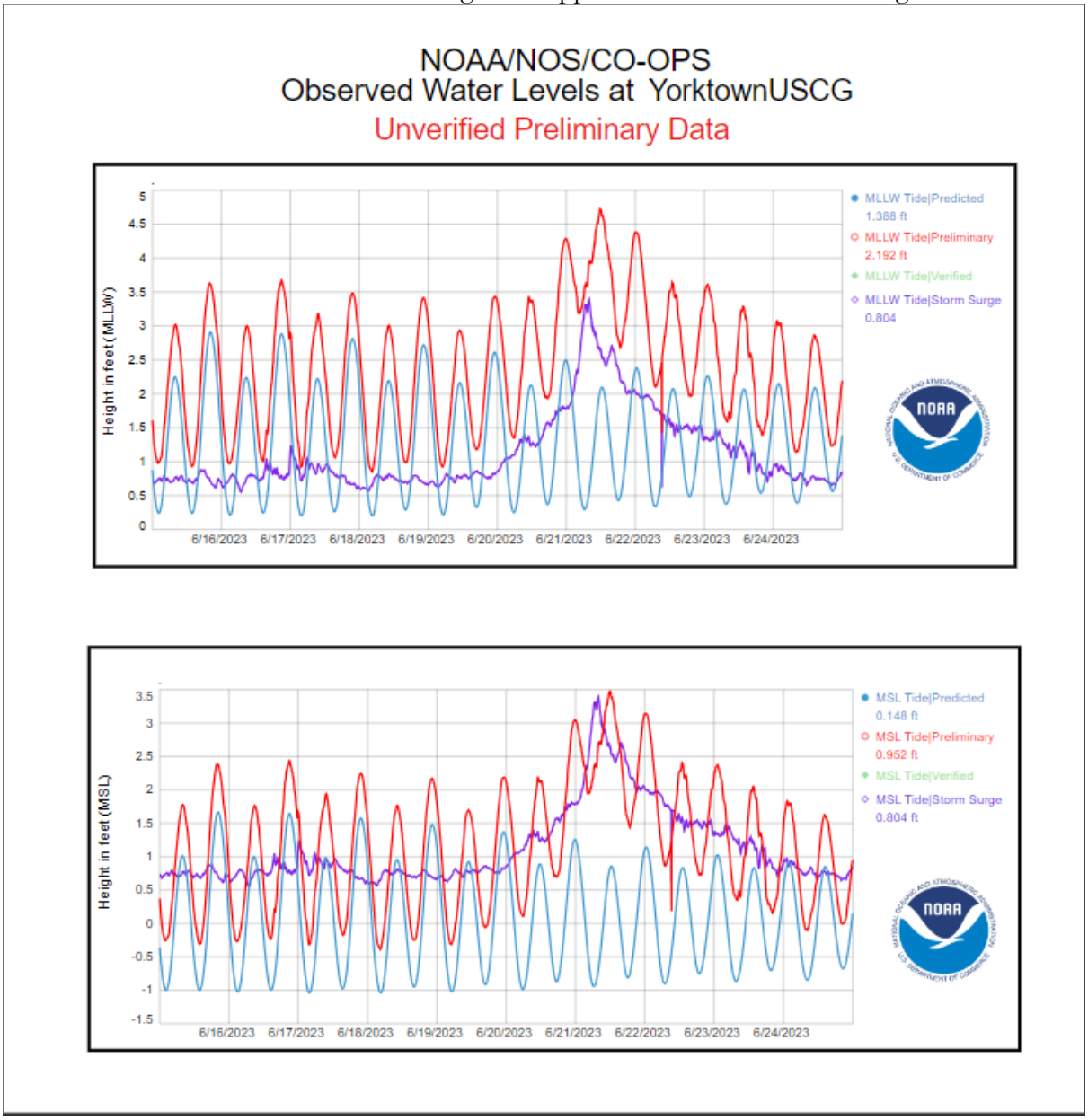


Figure 1. Preliminary data obtained from NOAA and a connection with Open Weather

- Sewells Point Tide Station:
  - Storm Surge: An approximate 3 foot storm surge was observed.

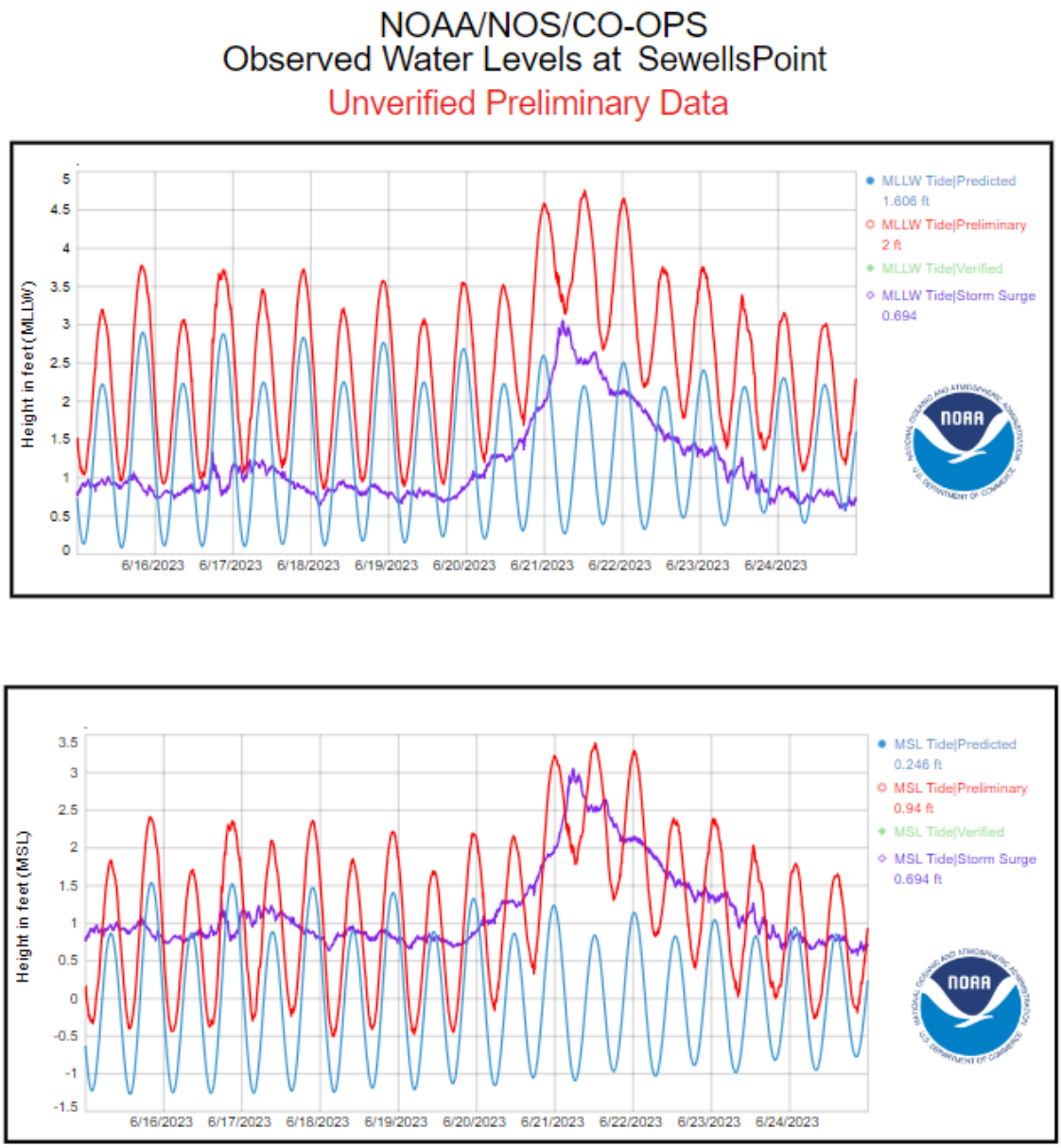


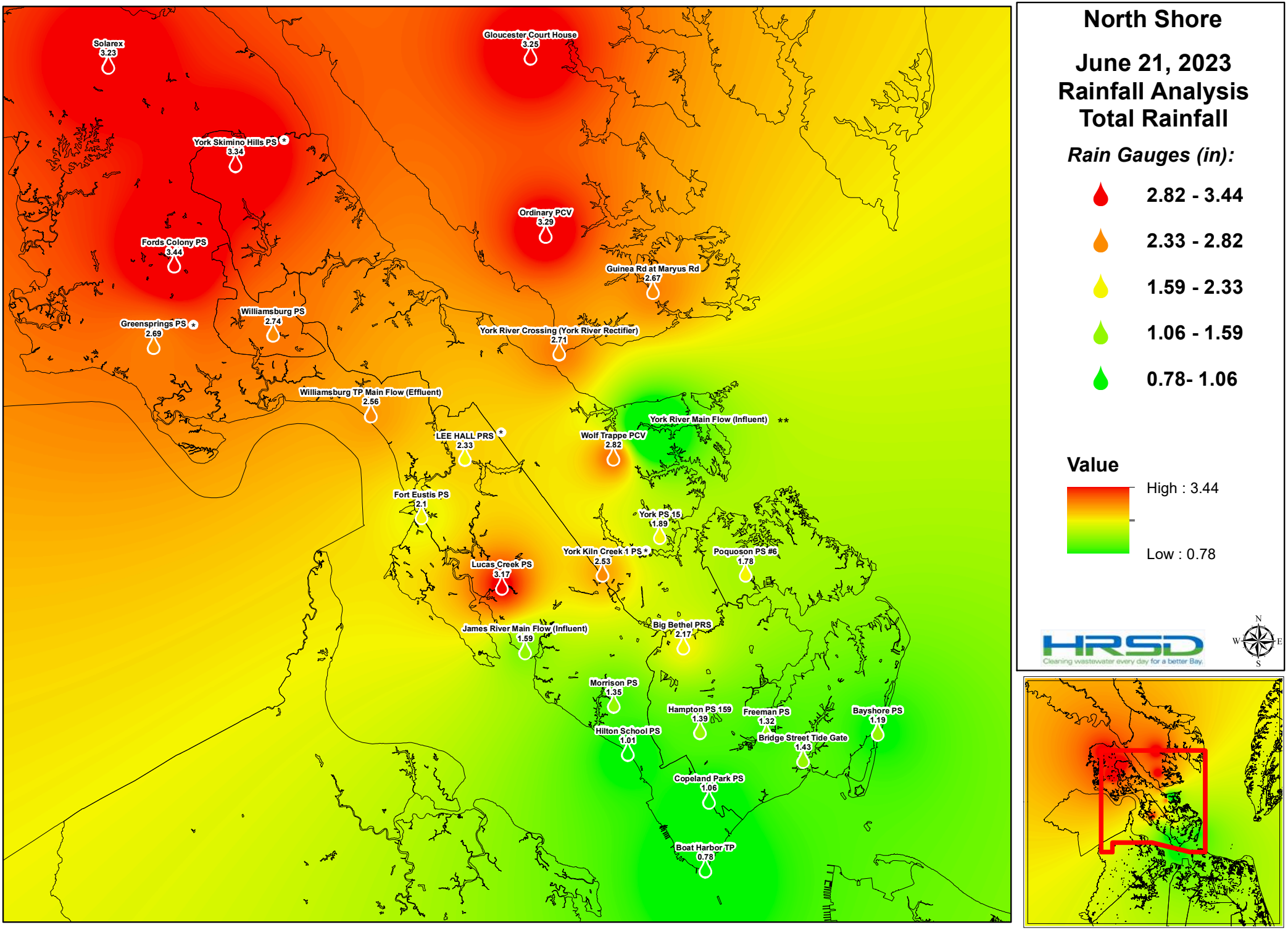
Figure 2. Preliminary data obtained from NOAA and a connection with Open Weather

Shallow Well Analysis:

Shallow wells are located at/or near HRSD Pump Stations to measure groundwater levels. The water column is measured using a pressure transducer located near the bottom of the well. The installed sensor measures gauge pressure in inches of water. The Shallow Well_NAVD88 measurement referenced in Appendix C refers to the elevation (referenced as NAVD 88) of the sensor plus the gauge measurement in feet.

Appendix A

HRSD Rain Gauge Network
Rainfall Totals



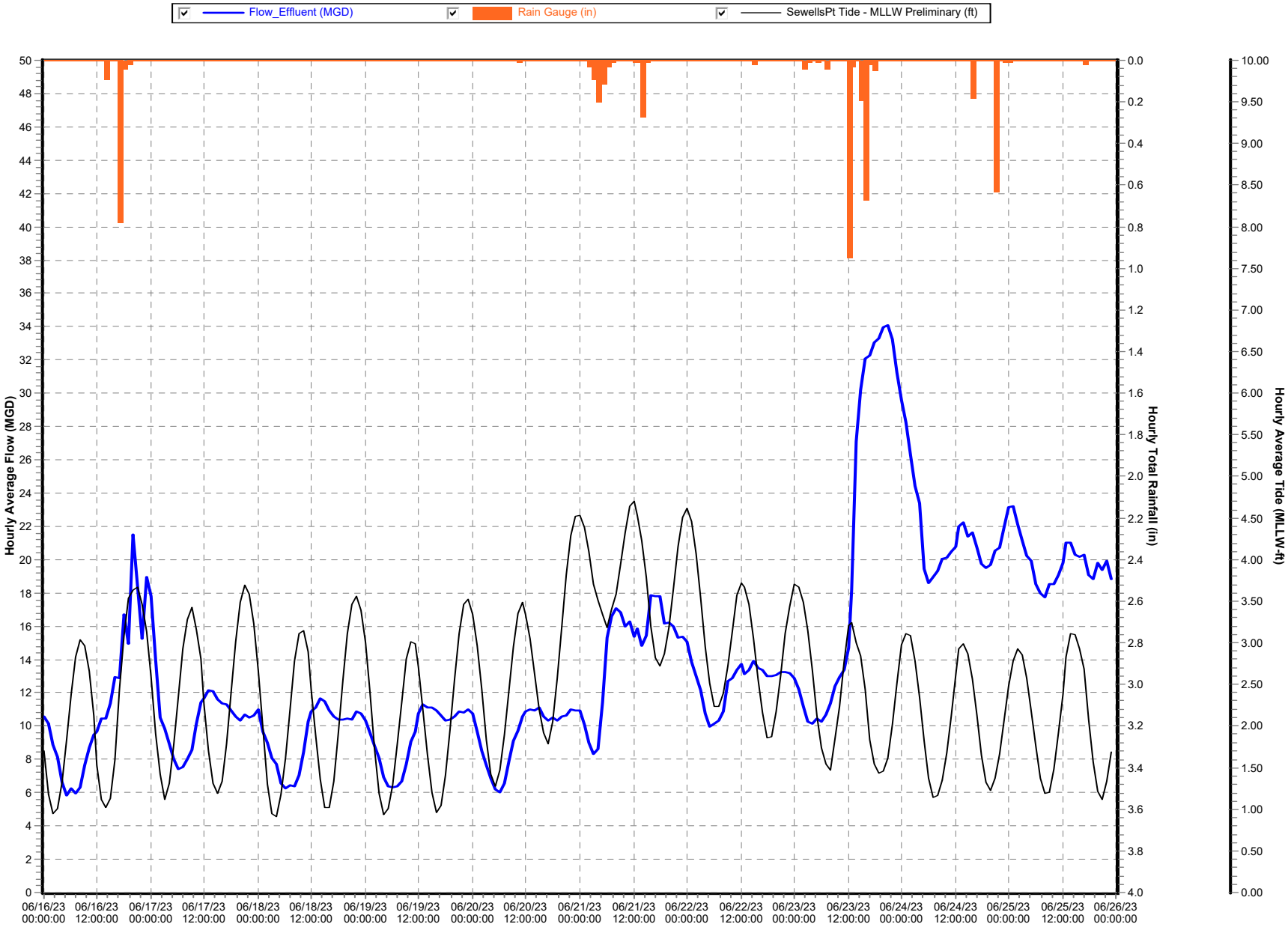
*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. **Rain Gauge disconnected during event

Appendix B

HRSD Treatment Plant Flows

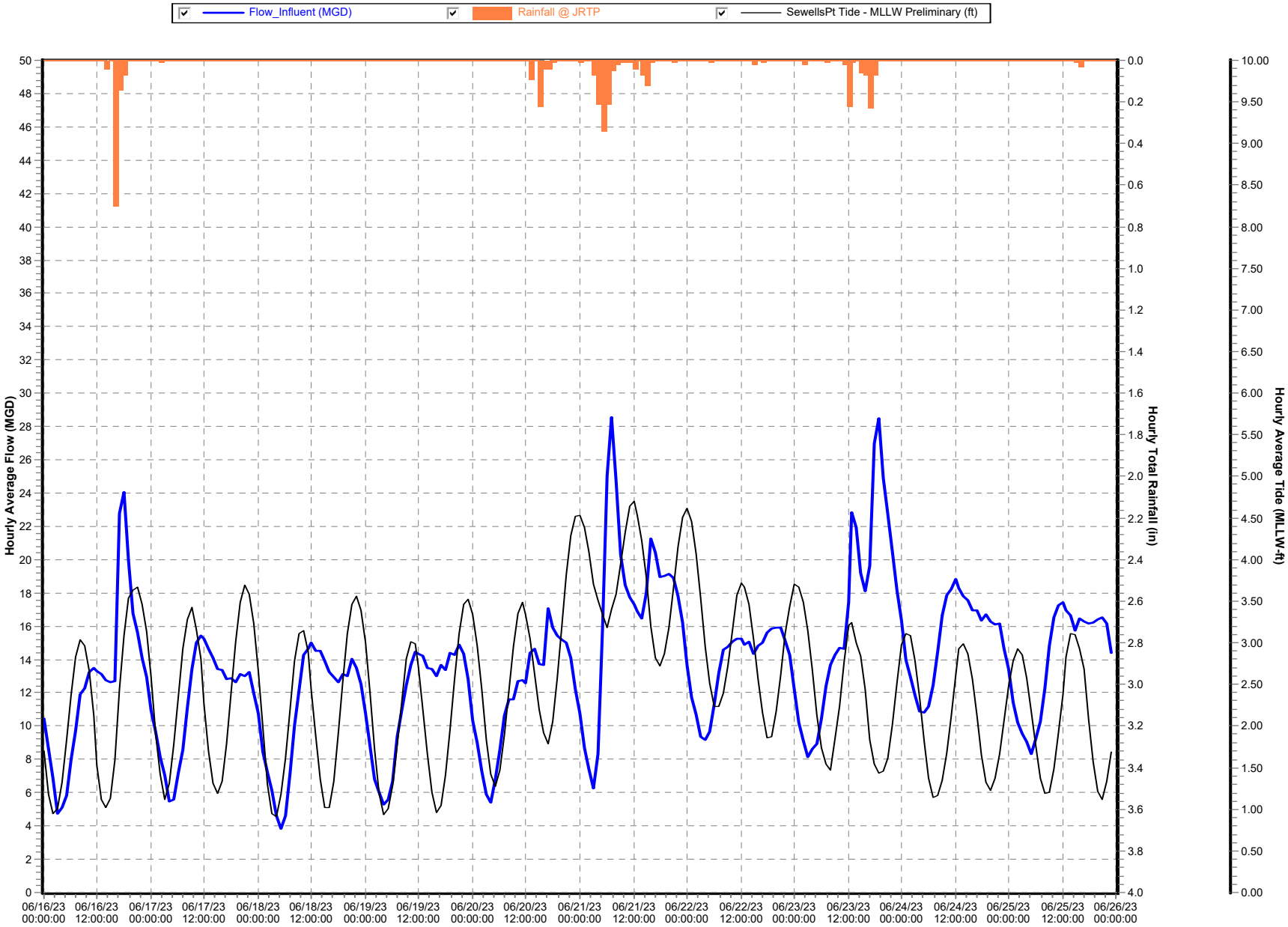
Boat Harbor Treatment Plant

MMPS-075 (06/16/23 to 06/26/23)



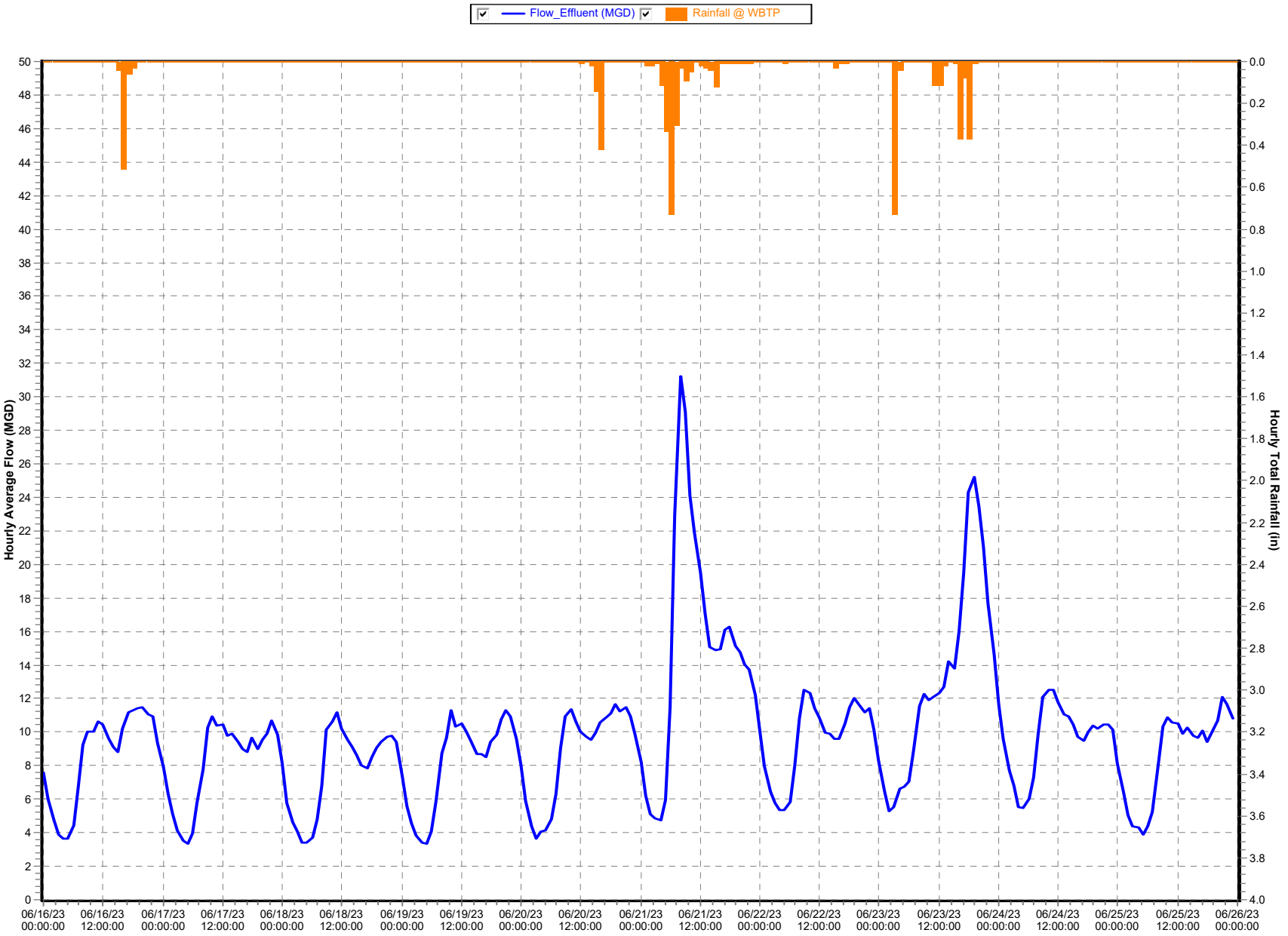
James River Treatment Plant

MMPS-184 (06/16/23 to 06/26/23)



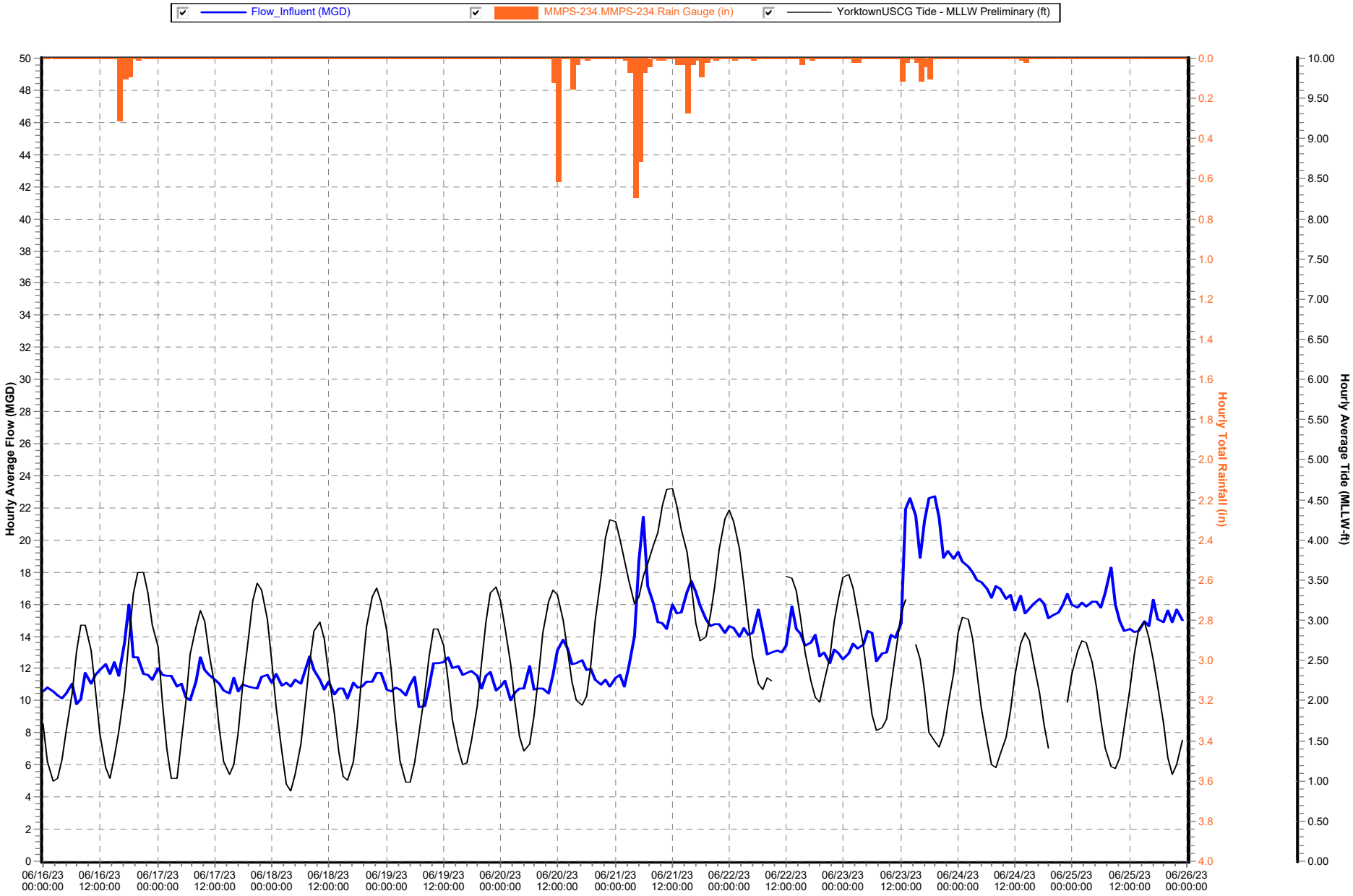
Williamsburg Treatment Plant

MMPS-222 (06/16/23 to 06/26/23)



York River Treatment Plant

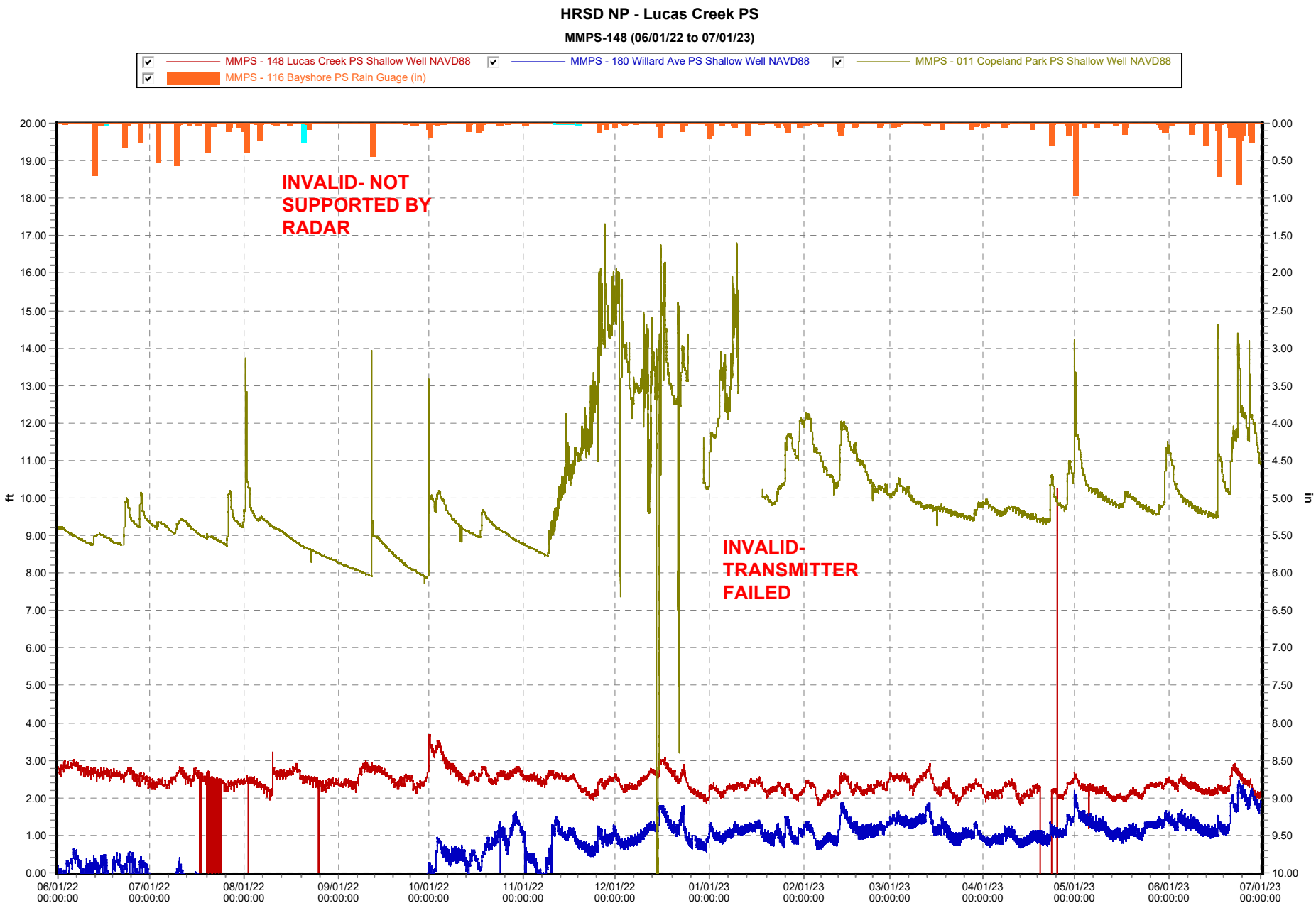
MMPS-235 (06/16/23 to 06/26/23)



Appendix C

Shallow Well Analysis

1 Year


HRSD NP - Lucas Creek PS
MMPS-148 (06/01/22 to 07/01/23)
MMPS - 148 Lucas Creek PS Shallow Well NAVD88
MMPS - 180 Willard Ave PS Shallow Well NAVD88
MMPS - 011 Copeland Park PS Shallow Well NAVD88
MMPS - 116 Bayshore PS Rain Guage (in)
INVALID- NOT SUPPORTED BY RADAR
INVALID- TRANSMITTER FAILED
ft
in
20.00
19.00
18.00
17.00
16.00
15.00
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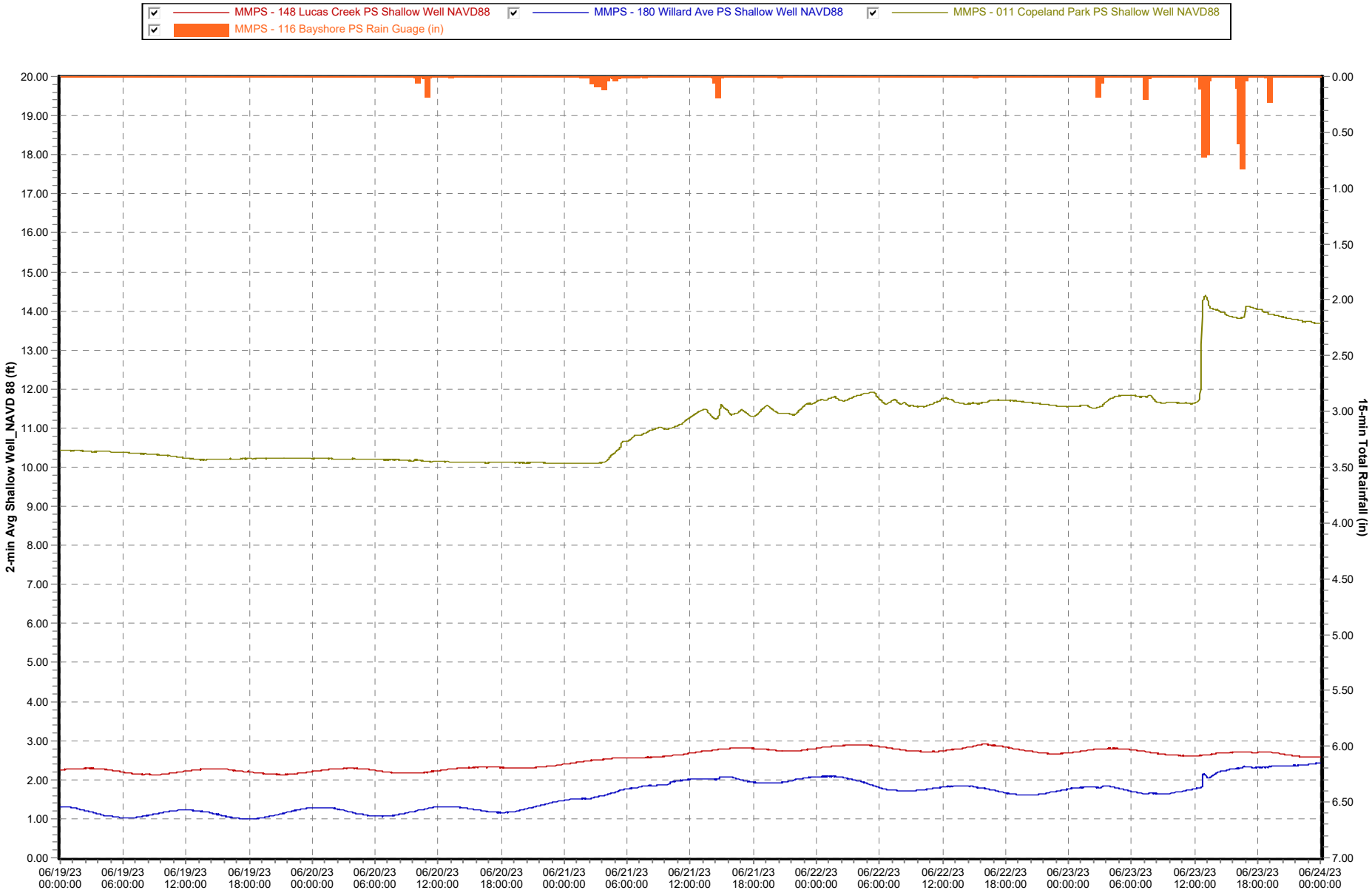
11/01/22 00:00:00
12/01/22 00:00:00
01/01/23 00:00:00
02/01/23 00:00:00
03/01/23 00:00:00
04/01/23 00:00:00
05/01/23 00:00:00
06/01/23 00:00:00
07/01/23 00:00:00

5 Day

North Shore Shallow Well Graphs

06/19/23 to 06/24/23



Hampton Roads Sanitation District

Post-Storm Report

6/22/2023 - 6/23/2023

HRSD
Cleaning wastewater every day for a better Bay.

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Summary

From June 22nd through June 23rd, there was an approximate 32-hour rainfall event that resulted in 3 sites on the North Shore and 5 sites on the South Shore that met a 1 to 10-year rainfall recurrence interval throughout the HRSD rain gauge network. Hampton roads saw off and on periods of showers and storms. More steady rain with pockets of heavy downpours occurred in the evening. North Shore sites averaged around 1.42 inches of rain while South Shore sites averaged around 1.15 inches. Previously, our area had seen an additional 40 hours of rainfall that had already brought approximately 2 inches of rainfall to NS and 0.75 to SS. There were impacts seen on groundwater levels compared to July 2022. See Appendix C for the Historical Shallow Well comparison.

One HRSD interceptor weather-related overflow(s) were reported.

HRSD flow and pressure meters met data reliability requirements per the MOM program. For all pressure meters in the aggregate and all pressure-side flow meters in the aggregate for each treatment plant service area listed below, at least 90% reliable data was achieved, based on the duration of system response to this rainfall event. The data reliability for the gravity flow meters is not included in this synopsis.

- Duration of system response: See Table Below
- Aggregate flow meter validity: 94.79%
- Aggregate pressure meter validity: 98.45%

Currently, rainfall recurrence intervals are only analyzed for a maximum of 96-hours. Rainfall analysis begins after 0.1 inches of rain has occurred. A 72-hour dry period of less than 0.1 inches of rain is typically used to signify two separate events. However, if a site returns to "dry weather" conditions prior to the next rainfall that occurs within 72 hours of the previous event, it is also considered for separate analysis. See Appendix A for the Rainfall Total System Maps.

The current criteria for publishing a post-storm analysis are the following:

- One or more rain gauge sites meet a two-year or greater RRI (rainfall recurrence interval) and at least 50% of sites in any treatment plant service area receive one inch of rainfall or greater,
- A rain gauge site meets a five-year or greater RRI, or
- A weather-related SSO occurs.

Sanitary Sewer Overflows:

HRSD - North Shore

Location	Locality	Start Date
Bayshore Manhole (720 Bayshore Ln)	Hampton	6/23/2023

Treatment Plant Data: ***(Data obtained from Telog Database)***
See Appendix B for HRSD Treatment Plant Flows

HRSD Treatment Plant Data
6/22/2023 – 6/23/2023

North Shore				
Treatment Plant	**Date of Peak Hourly Flow**	**Peak Hourly Flow (MGD)**	**Peak Hour**	**TPSA Total Rainfall Avg (in)**
Boat Harbor	6/22/2023	15.09	00:00	2.45
	6/23/2023	34.06	21:00	2.48
James River	6/22/2023	15.92	20:00	0.03
	6/23/2023	28.51	19:00	0.98
Williamsburg	6/22/2023	12.53	09:00	0.10
	6/23/2023	25.23	19:00	1.30
York River	6/22/2023	15.85	13:00	0.03
	6/23/2023	22.70	19:00	1.15

HRSD Treatment Plant Data
6/22/2023 – 6/23/2023

South Shore				
Treatment Plant	**Date of Peak Hourly Flow**	**Peak Hourly Flow (MGD)**	**Peak Hour**	**TPSA Total Rainfall Avg (in)**
Army Base	6/22/2023	11.01	19:00	0.01
	6/23/2023	18.53	14:00	2.15
Atlantic	6/22/2023	59.98	20:00	0.01
	6/23/2023	73.45	09:00	1.05
Nansemond	6/22/2023	20.27	21:00	0.16
	6/23/2023	30.44	14:00	1.15
VIP	6/22/2023	33.22	00:00	0.01
	6/23/2023	65.61	15:00	1.65

North Shore

Weather:

Rainfall (HRSD Rainfall Gauges): *Recurrence intervals based on NOAA Atlas 14*

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Boat Harbor Treatment Plant Service Area[1]		
Bayshore PS	10-year (6hr)	HAMP
Bridge Street Tide Gate	1- to 2-year (6hr)	HAMP
Boat Harbor	DNQ	NEWP
Copeland Park PS	DNQ	NEWP
Hampton PS 159	DNQ	HAMP
James River Treatment Plant Service Area[1]		
Hilton School PS	DNQ	NEWP
James River Main Flow (Influent)	DNQ	NEWP
Lee Hall PRS	DNQ	NEWP
Lucas Creek PS	DNQ	NEWP
Morrison PS	DNQ	NEWP
Williamsburg Treatment Plant Service Area[1]		
Ford's Colony	DNQ	JCSA
Fort Eustis PS	DNQ	NEWP
Greensprings PS	DNQ	JCA
Solarex	1-year (1hr)	JCSA
Williamsburg Main Flow (Effluent)	DNQ	JCSA
Williamsburg PS	DNQ	WILL
York Skimino Hills PS	Invalid	YORK
York River Treatment Plant Service Area[1]		
Big Bethel PRS	DNQ	HAMP
Freeman PS	DNQ	HAMP
Gloucester Court House	DNQ	GLOU
Guinea Rd at Maryus Rd	DNQ	GLOU
Ordinary PCV	DNQ	GLOU
Poquoson PS 6	Invalid	POQ
Wolf Trappe PCV	DNQ	YORK
York Kiln Creek 1 PS	DNQ	YORK
York PS 15	Invalid	YORK
York River Main Flow (Influent)	Disconnected	YORK
York River Crossing (York River Rectifier)	DNQ	GLOU

Note:

1. Typical treatment plant service area.

Newport News-Williamsburg International (PHF)

- Wind and Rainfall (daily total):

Date	Gust (max)	Sustained (max)	Sustained (avg)	Direction	Rainfall (in)
6/22/23	25 mph	17 mph	7 mph	S	0.02
6/23/23	20 mph	13 mph	6 mph	NW	0.65

Tide:

- Yorktown USCG Training Center:
  - Storm Surge: An approximate 1.5-foot storm surge was observed.

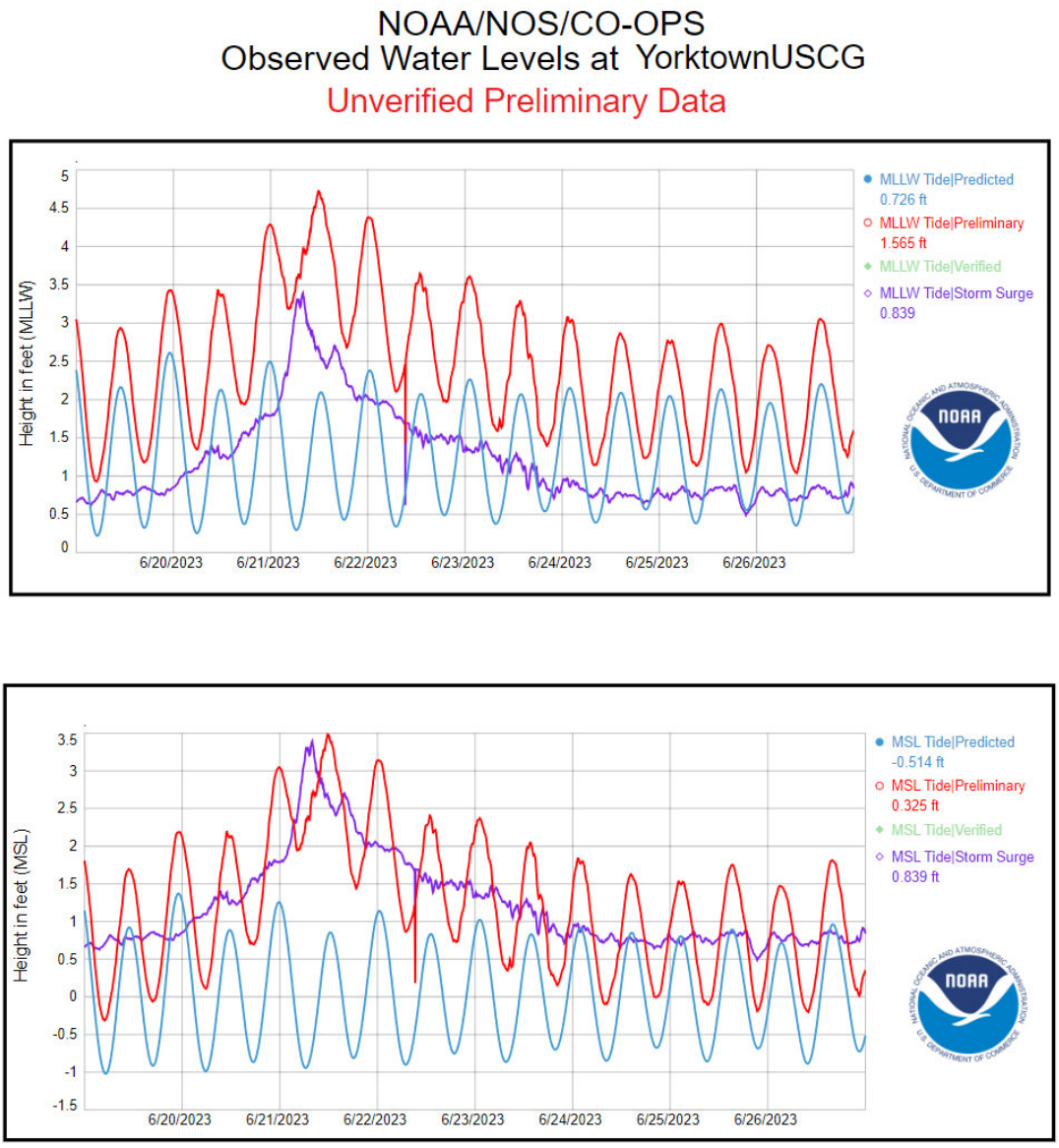


Figure 1. Preliminary data obtained from NOAA and a connection with Open Weather

- Sewells Point Tide Station:
  - Storm Surge: An approximate 1.4 foot storm surge was observed.

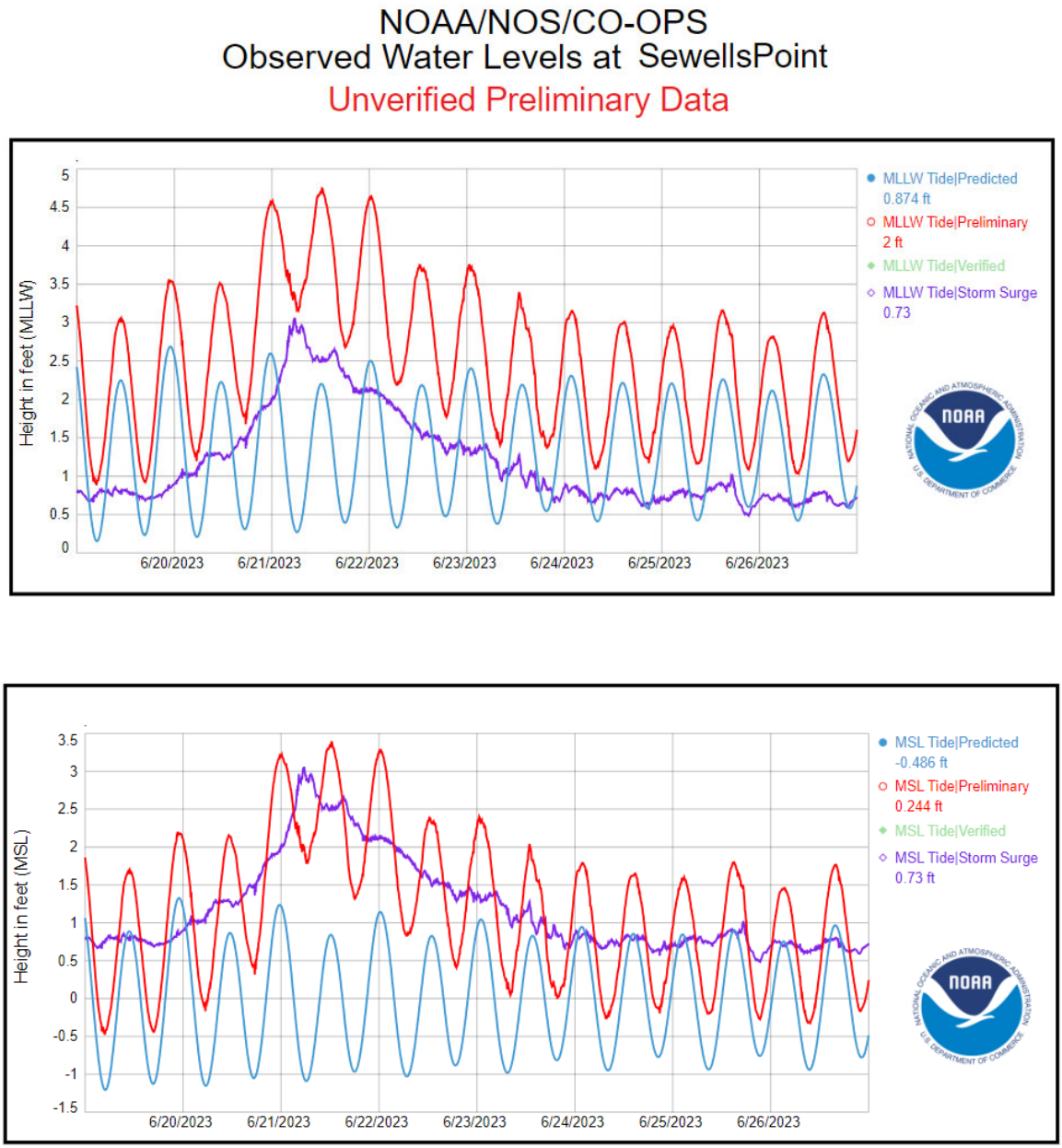


Figure 2. Preliminary data obtained from NOAA and a connection with Open Weather

South Shore

Weather:

Rainfall (HRSD Rainfall Gauges): *Recurrence intervals based on NOAA Atlas 14*

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Army Base Treatment Plant Service Area[1]		
Bancker Rd (Dovercourt Discharge)	DNQ	NORF
Taussig Blvd PS	1-year (6hr)	NORF
Atlantic Treatment Plant Service Area[1]		
Callison at GB Locks	DNQ	CHES
Chesapeake PS 243	DNQ	CHES
Chesapeake PS 254	DNQ	CHES
Courthouse PRS	DNQ	VAB
Elbow Rd	DNQ	CHES
John B. Dey MLV-AT side	DNQ	VAB
Kempsville PRS	DNQ	VAB
Lagomar IFM at Atlantic TP	DNQ	VAB
Laskin Rd PRS	DNQ	VAB
Pine Tree PRS	DNQ	VAB
Shipps Corner PRS	DNQ	VAB
Ches-Liz Treatment Plant Service Area[1]		
Dozier's Corner PS	DNQ	CHES
Independence PRS	DNQ	VAB
Northampton Blvd at Wesleyan Dr	DNQ	NORF
Providence PRS	DNQ	VAB
Shore Dr @ Jack Frost	DNQ	CHES
Nansemond Treatment Plant Service Area[1]		
Bowers Hill PRS	DNQ	CHES
Cedar Lane PS	DNQ	PORT
Chesapeake PS 158	DNQ	CHES
Chesapeake PS 238	DNQ	CHES
Crittenden Rd_Chuckatuck Rectifier	2-year (1hr)	SUFF
Deep Creek PRS	DNQ	CHES
Lake Kilby WTP	DNQ	SUFF
Nansemond Main Flow (Effluent)	DNQ	SUFF
Pagan River Rectifier	DNQ	IOW
Pughsville PS	DNQ	SUFF
Route 337 PRS	DNQ	CHES
Smithfield High School	1-year (1hr)	IOW
Suffolk PS	DNQ	SUFF
Suffolk PS 81	DNQ	SUFF
Suffolk PS 87	DNQ	SUFF
Windsor Duke St PS	DNQ	IOW

VIP Treatment Plant Service Area[1]

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Elizabeth River Crossing_Eastern Branch	1- to 2-year (1hr)	NORF
Ferebee Avenue PS	DNQ	CHES
Luxembourg Avenue PS	DNQ	NORF
Rodman Ave PS	Invalid	PORT
Va Beach Blvd PS	2-year (2hr)	NORF
VIP Main Flow (Effluent)	DNQ	NORF

Note:

1. Typical treatment plant service area.

*Duration represents the minimum amount of time it took to reach the specified RRI.

Norfolk International Airport (ORF)

- Wind and Rainfall (daily total):

Date	Gust (max)	Sustained (max)	Sustained (avg)	Direction	Rainfall (in)
6/22/23	21 mph	10 mph	7 mph	NE	0.01
6/23/23	35 mph	10 mph	3 mph	S	2.18

Tide:

- Sewells Point Tide Station:
  - Storm Surge: An approximate 1.4 foot storm surge was observed.

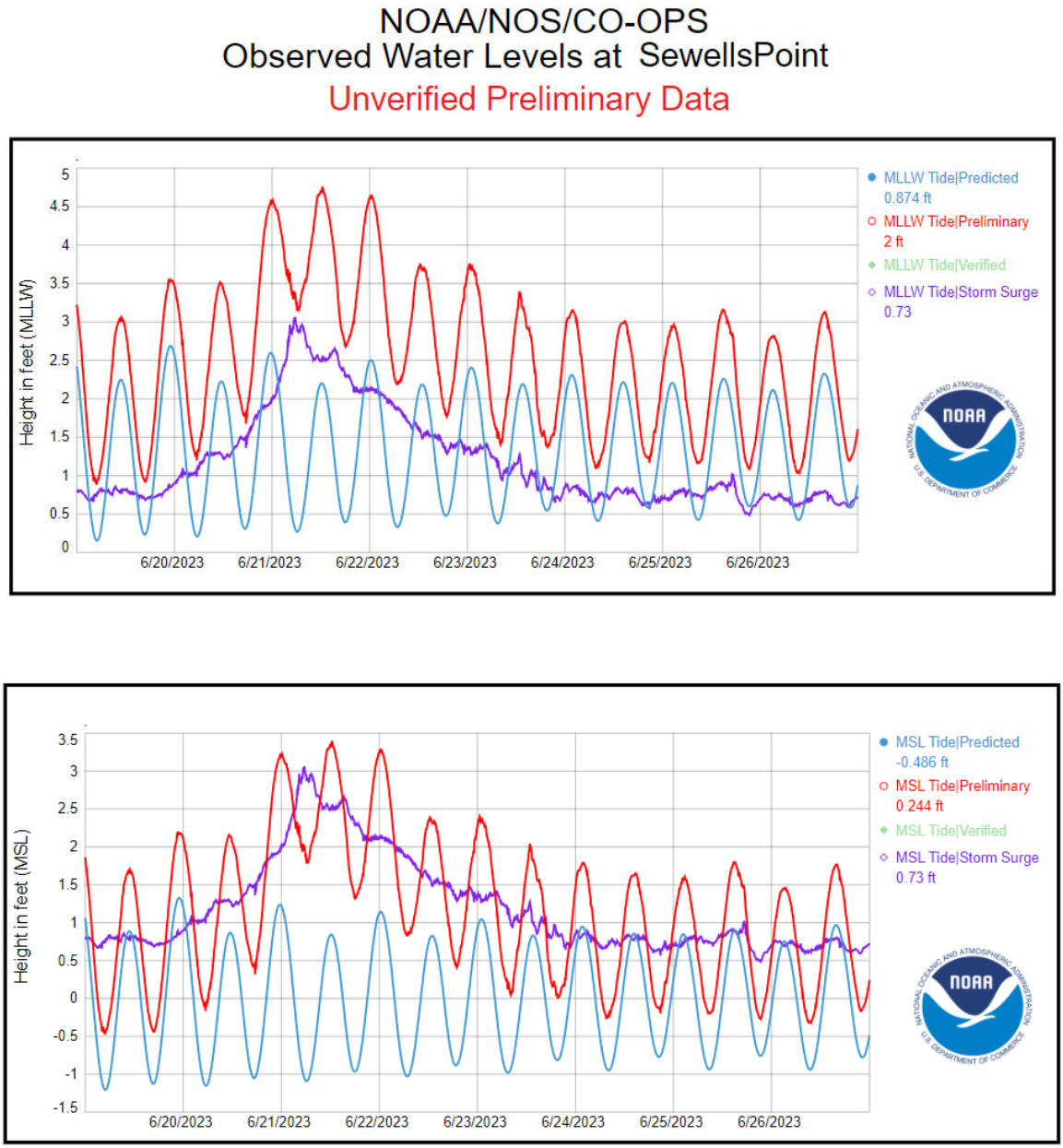


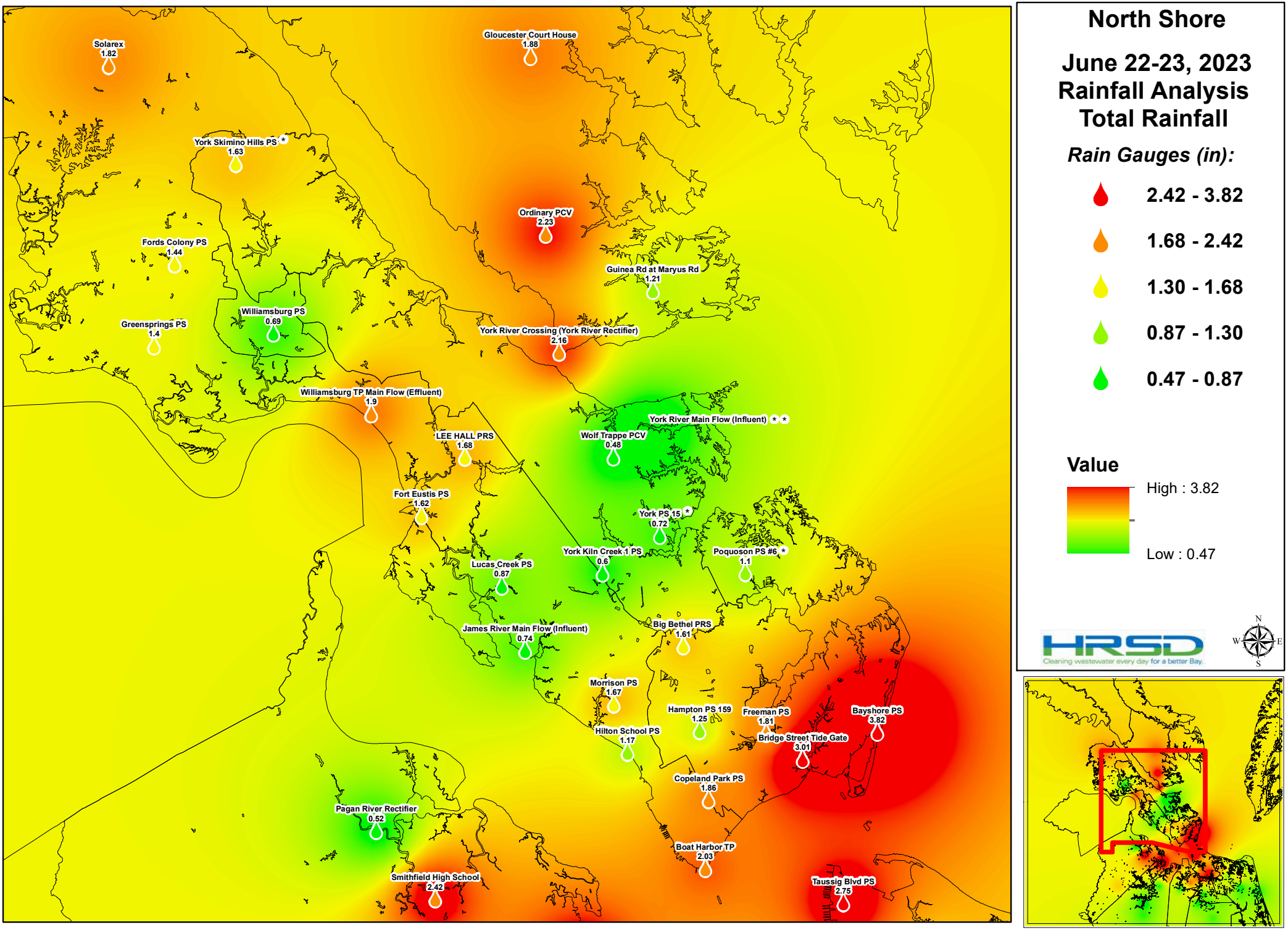
Figure 3. Preliminary data obtained from NOAA and a connection with Open Weather

Shallow Well Analysis:

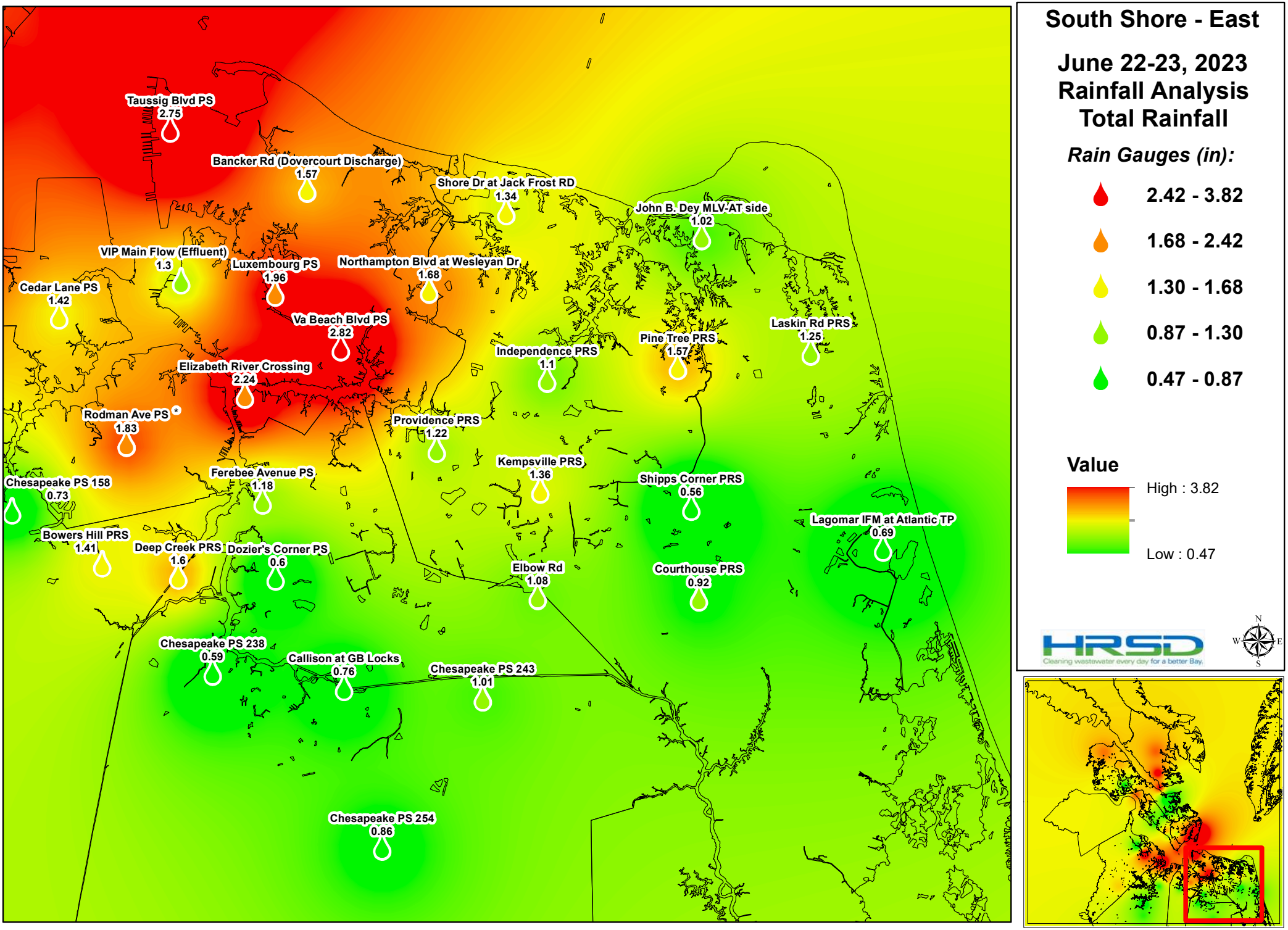
Shallow wells are located at/or near HRSD Pump Stations to measure groundwater levels. The water column is measured using a pressure transducer located near the bottom of the well. The installed sensor measures gauge pressure in inches of water. The Shallow Well_NAVD88 measurement referenced in Appendix C refers to the elevation (referenced as NAVD 88) of the sensor plus the gauge measurement in feet.

Appendix A

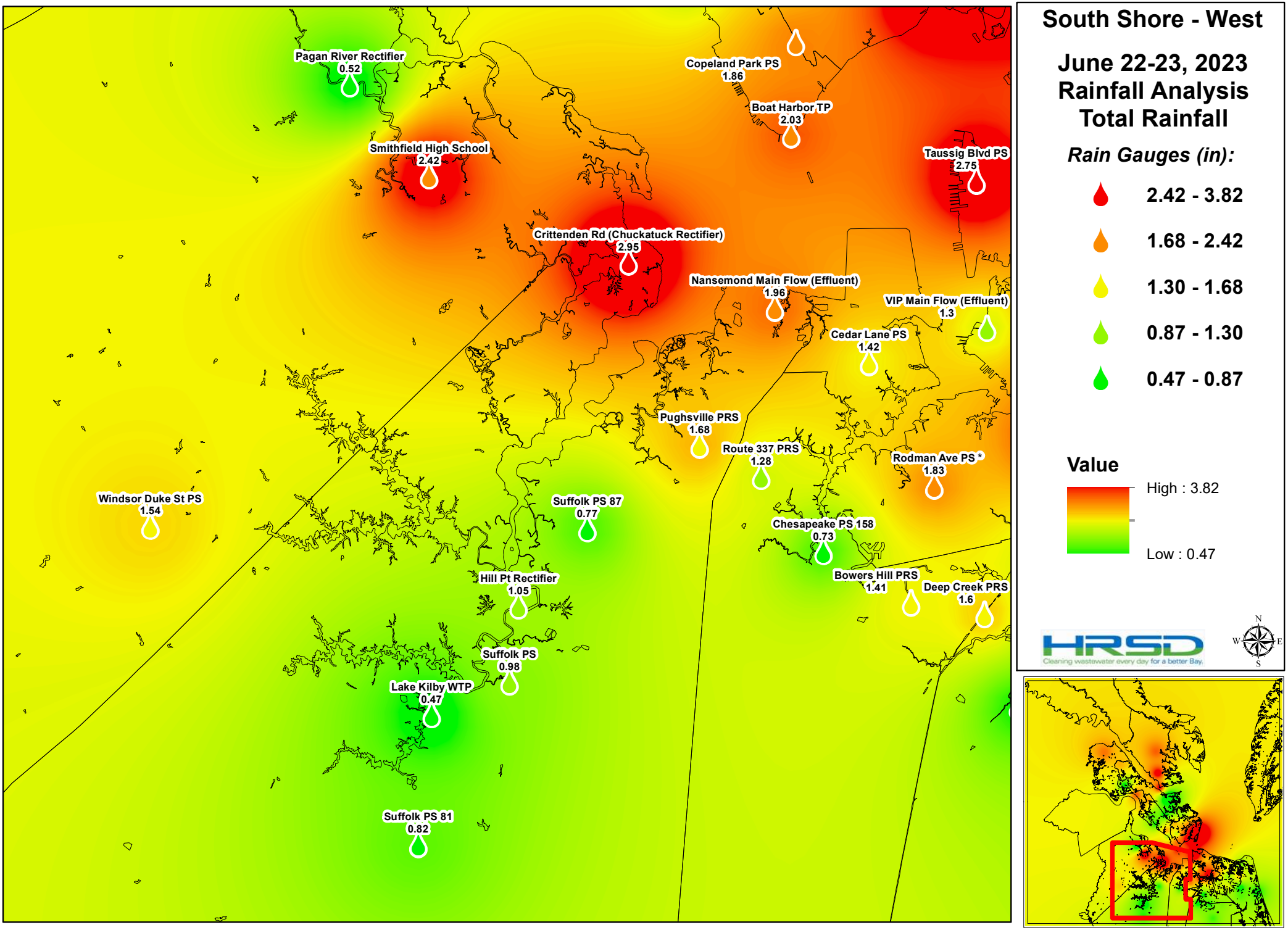
HRSD Rain Gauge Network
Rainfall Totals



*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. **Rain Gauge disconnected during event



*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. **Rain Gauge disconnected during event



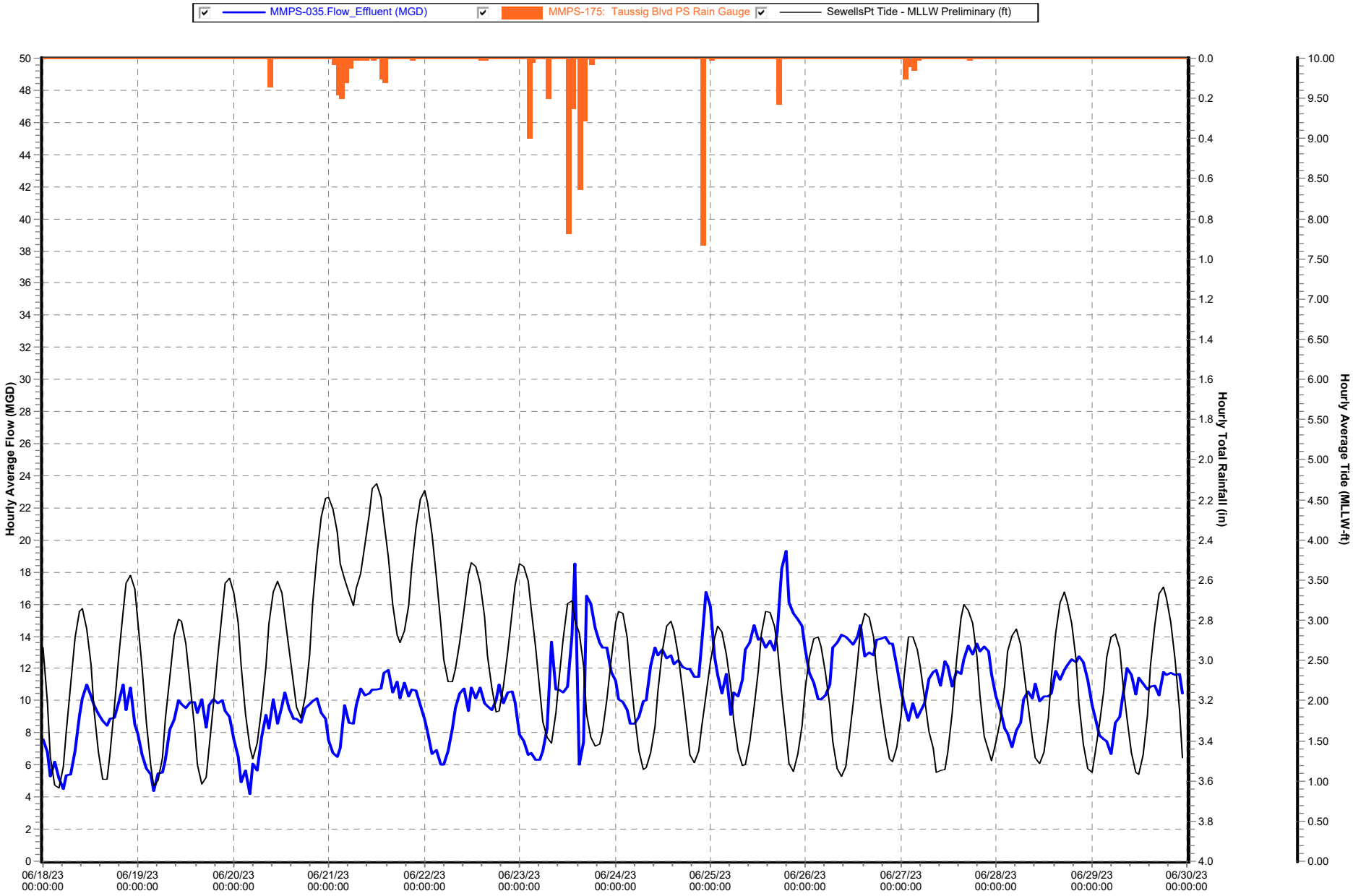
*Note: Rain Gauge was invalid for event and an average of surrounding sites was used. **Rain Gauge disconnected during event

Appendix B

HRSD Treatment Plant Flows

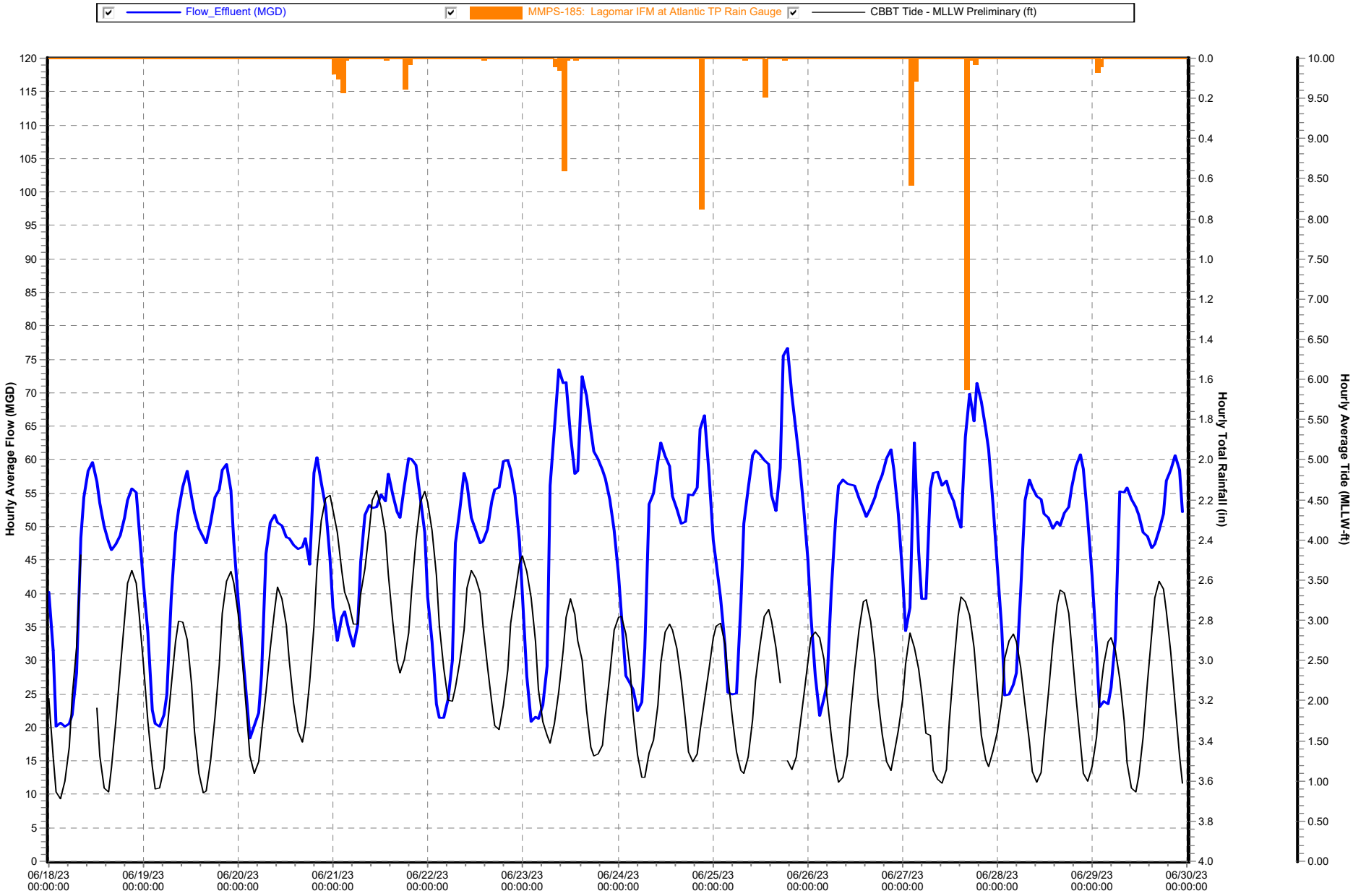
Army Base Treatment Plant

MMPS-035 (06/18/23 to 06/30/23)



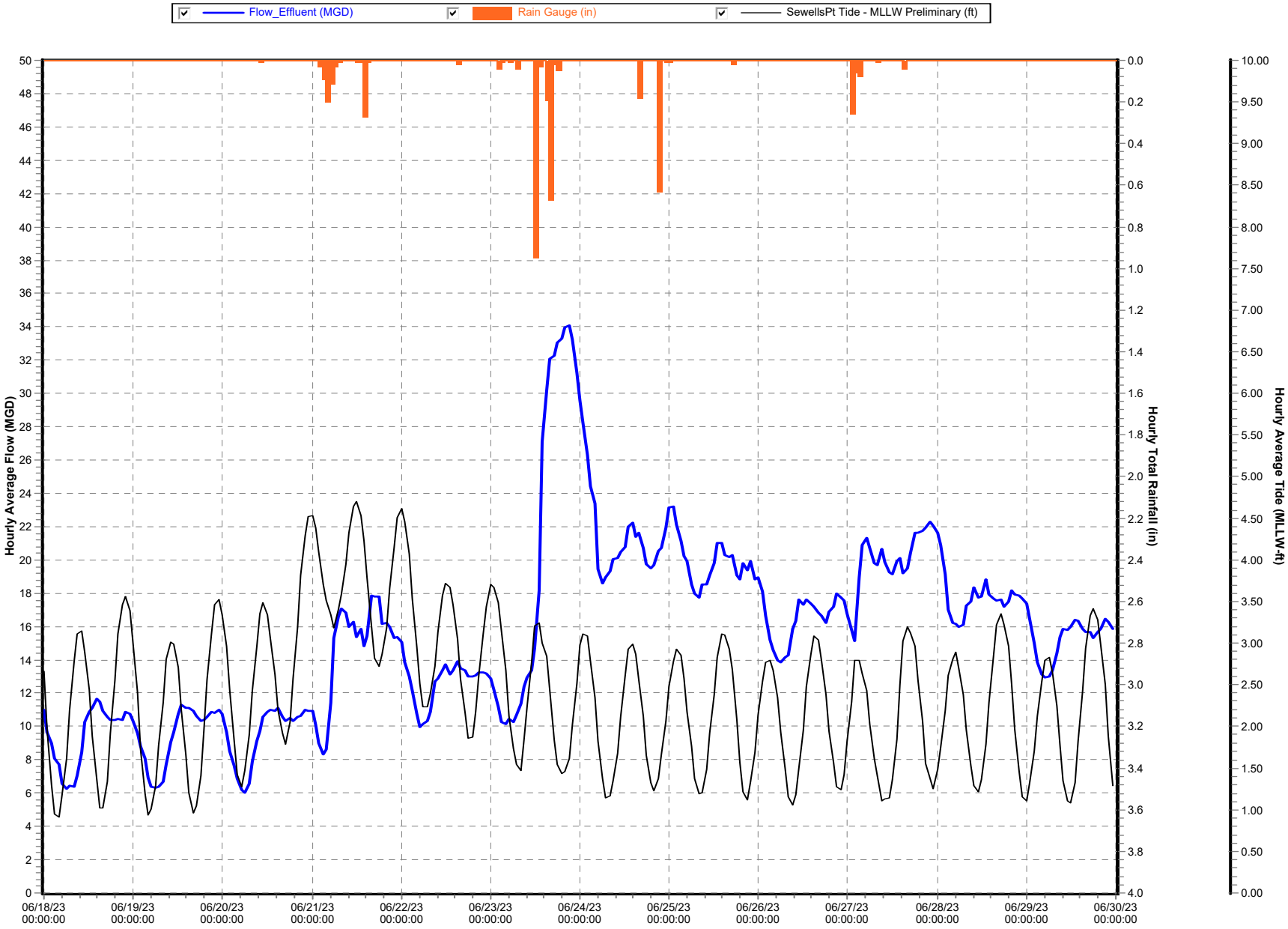
Atlantic Treatment Plant

MMPS-071 (06/18/23 to 06/30/23)



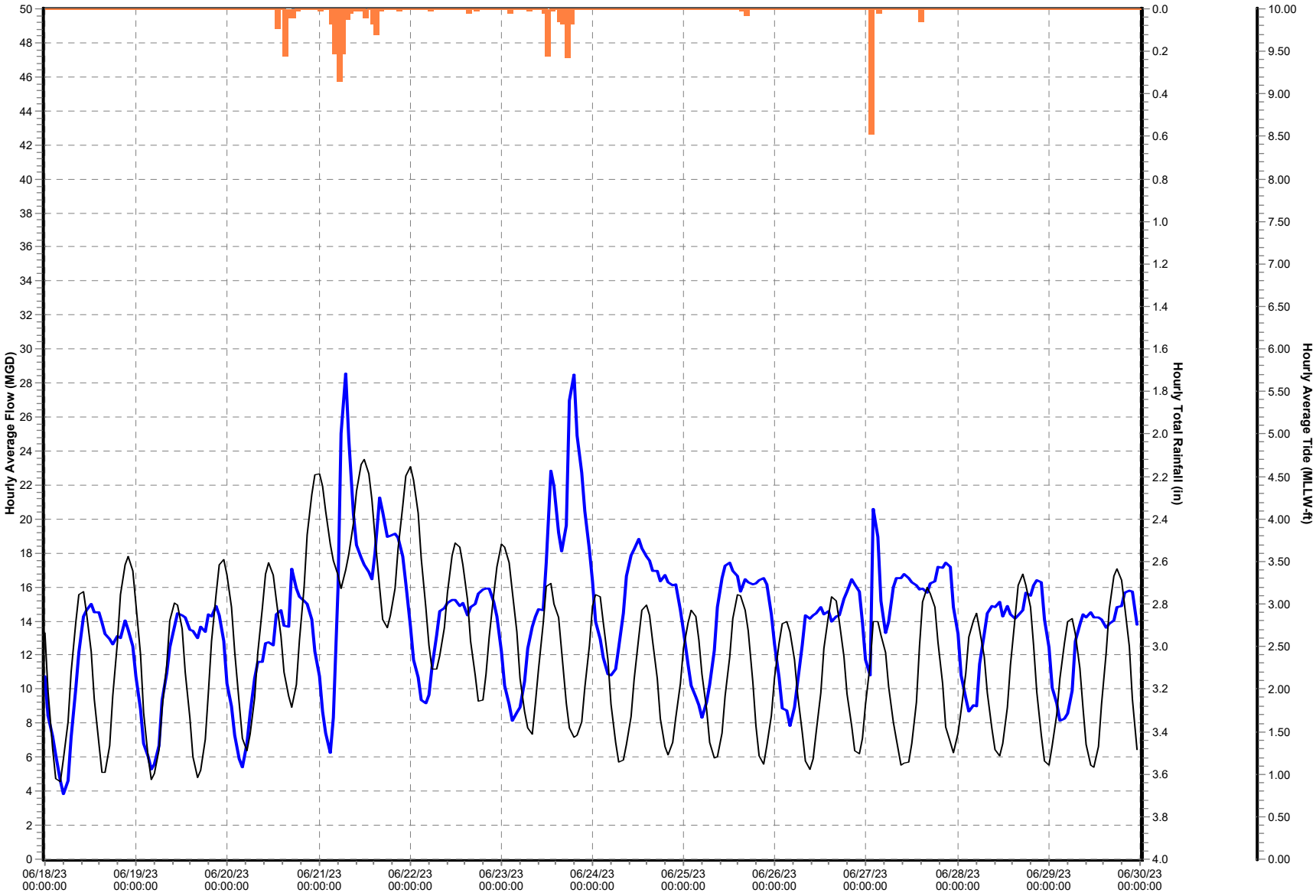
Boat Harbor Treatment Plant

MMPS-075 (06/18/23 to 06/30/23)



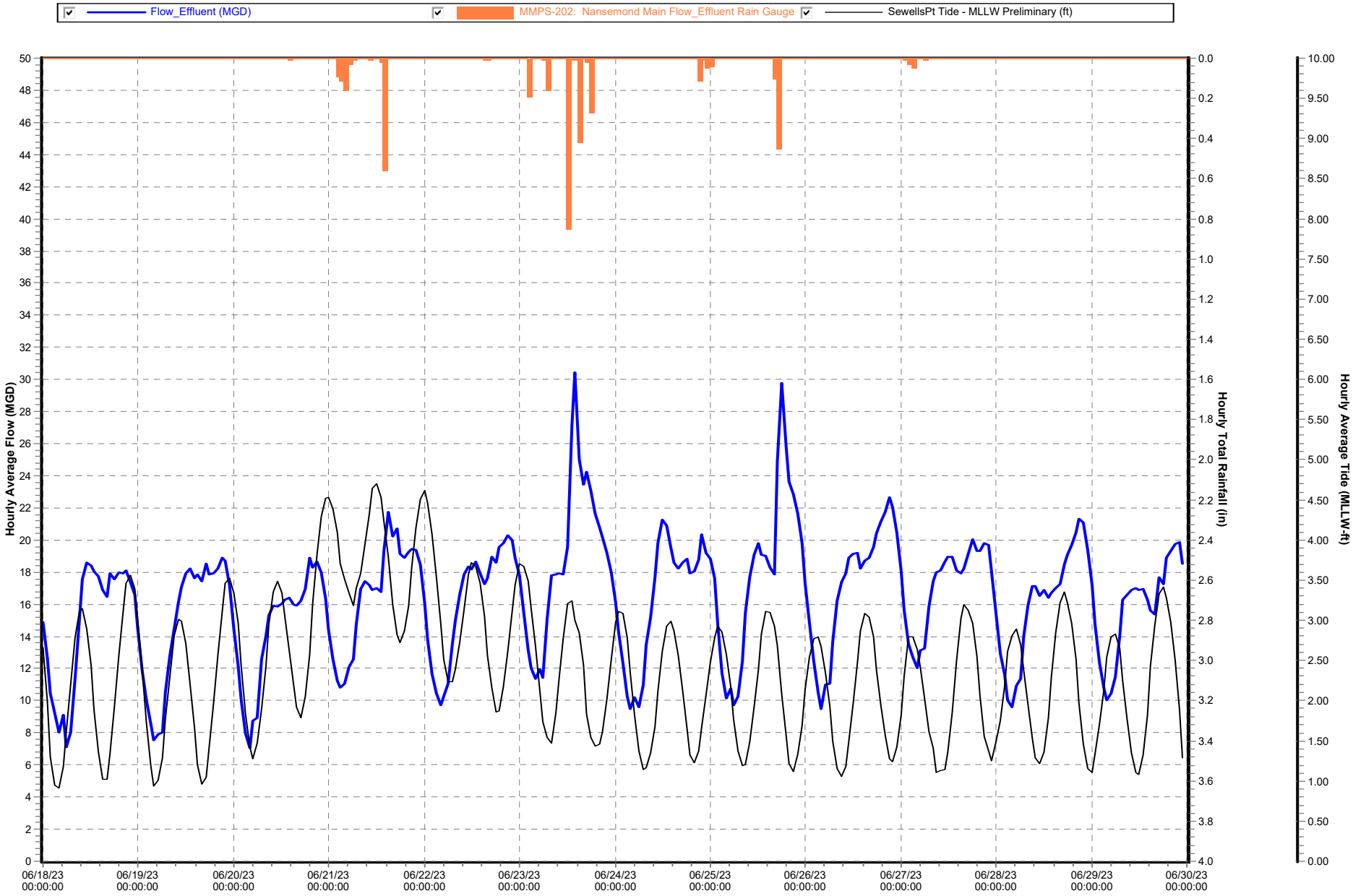
James River Treatment Plant

MMPS-184 (06/18/23 to 06/30/23)



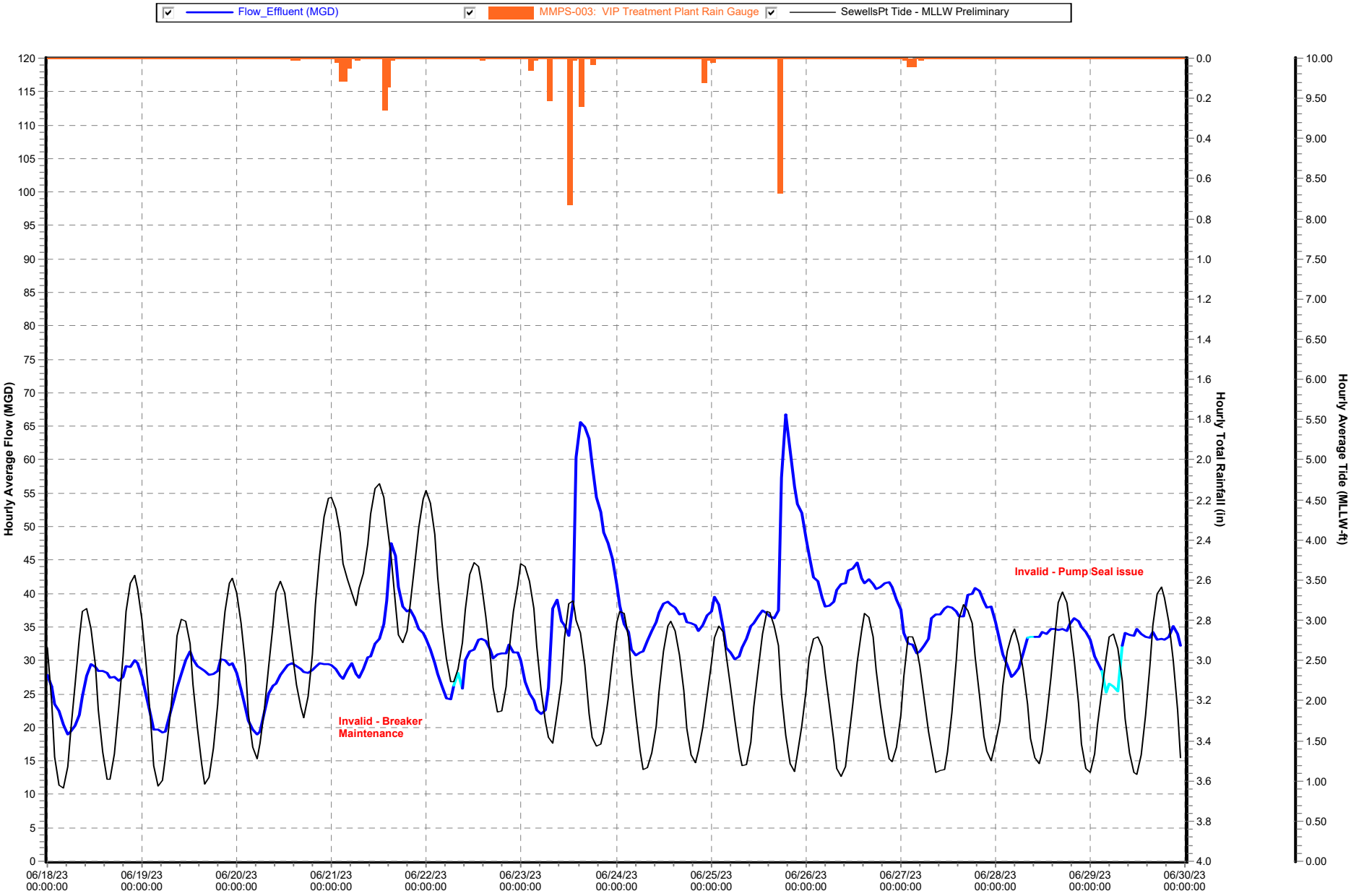
Nansemond Treatment Plant

MMPS-202 (06/18/23 to 06/30/23)



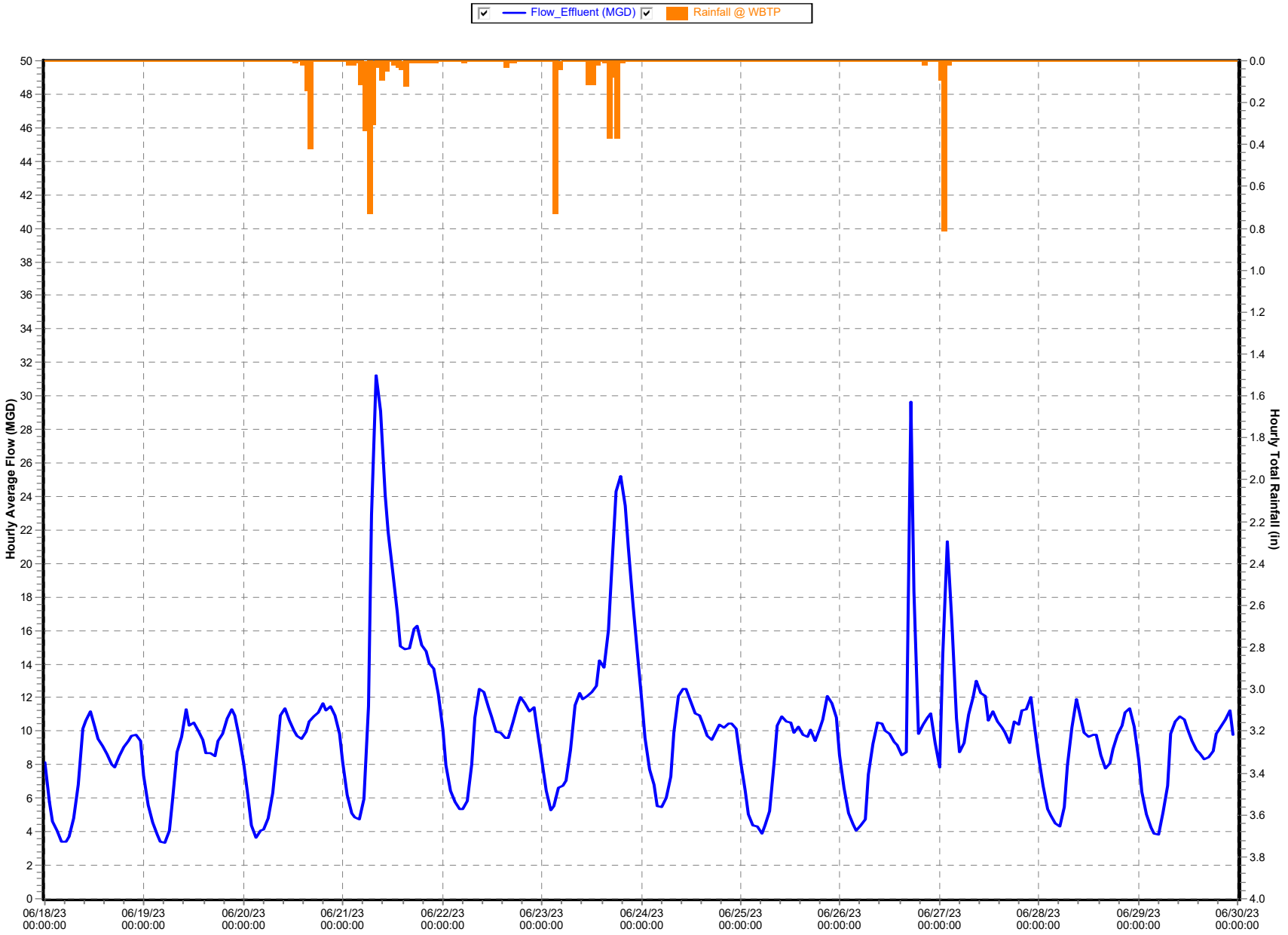
VIP Treatment Plant

MMPS-003 (06/18/23 to 06/30/23)



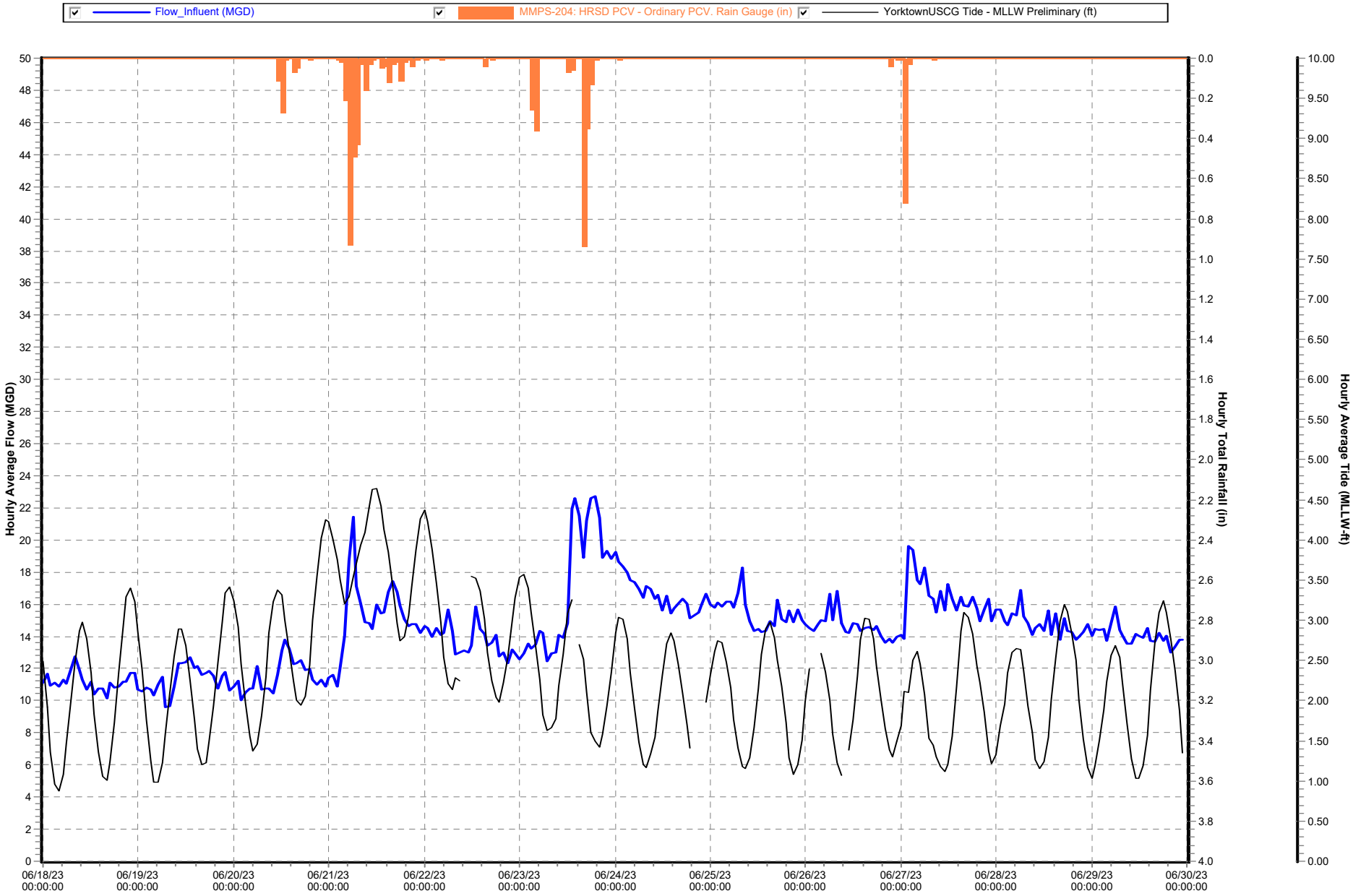
Williamsburg Treatment Plant

MMPS-222 (06/18/23 to 06/30/23)



York River Treatment Plant

MMPS-235 (06/18/23 to 06/30/23)



Appendix C

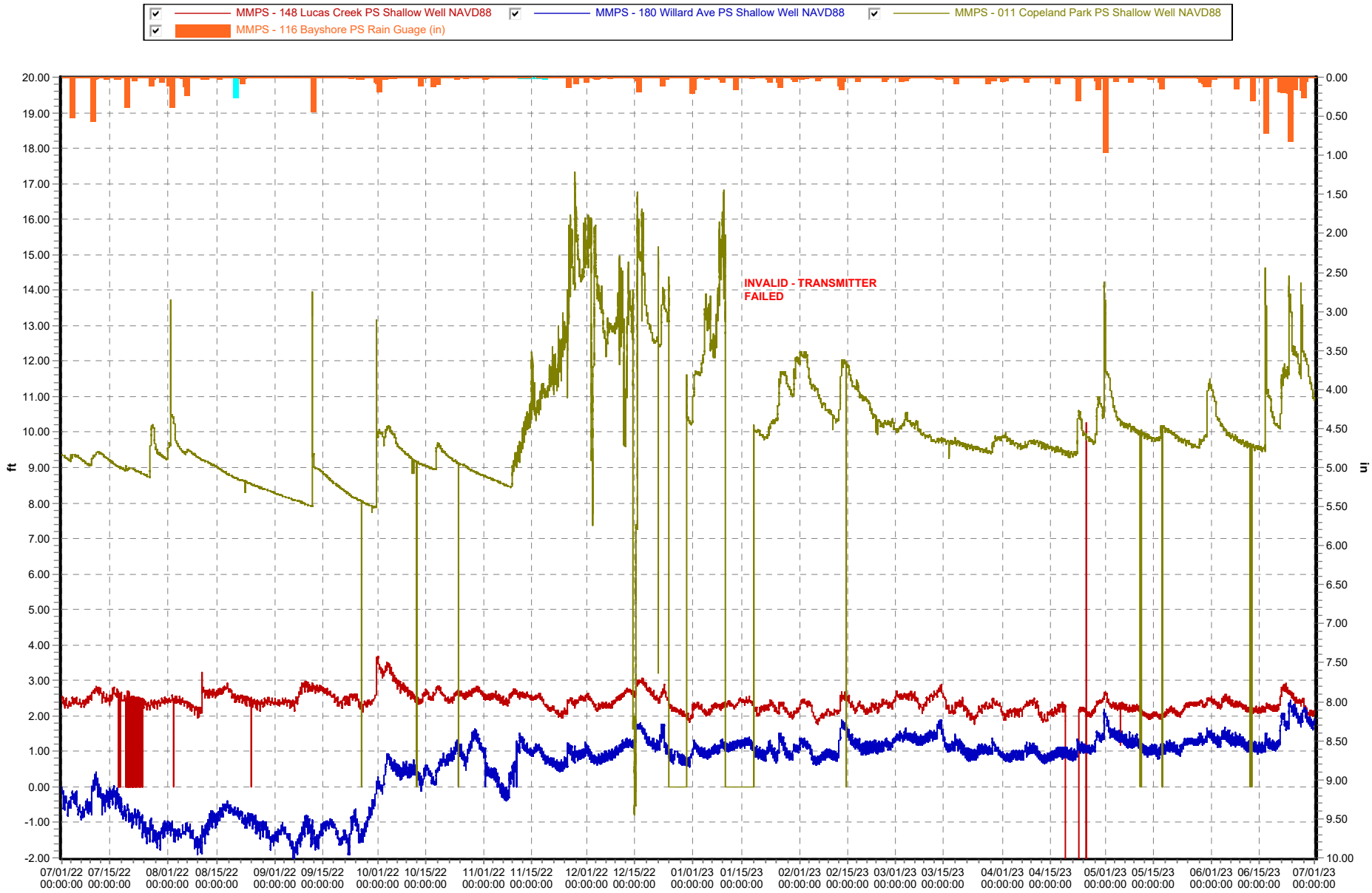
Shallow Well Analysis

Teal showing invalid RG data

1-year

North Shore Shallow Well Graph

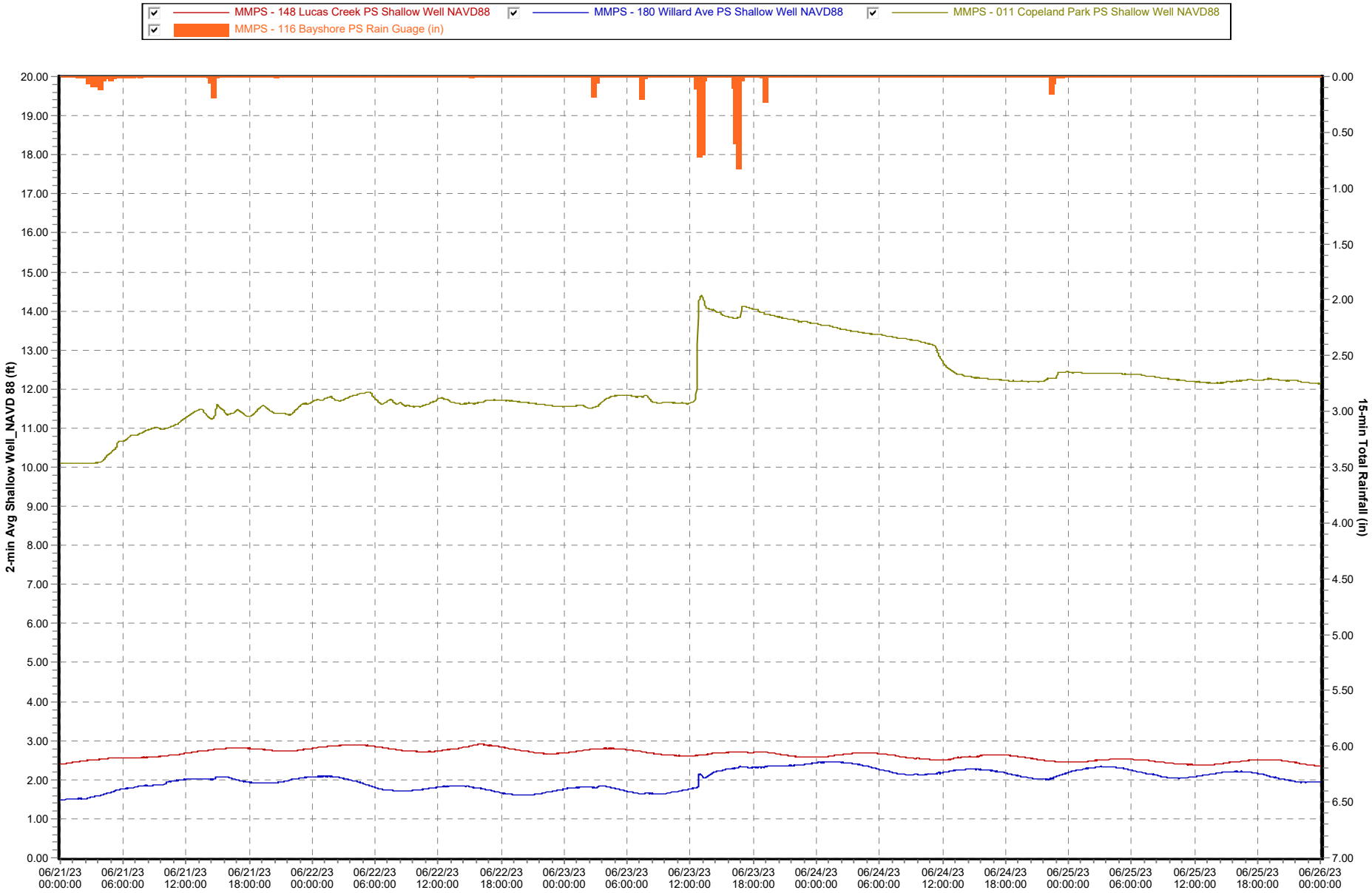
MMPS-148 (07/01/22 to 07/01/23)



5-day

North Shore Shallow Well Graphs

06/21/23 to 06/26/23

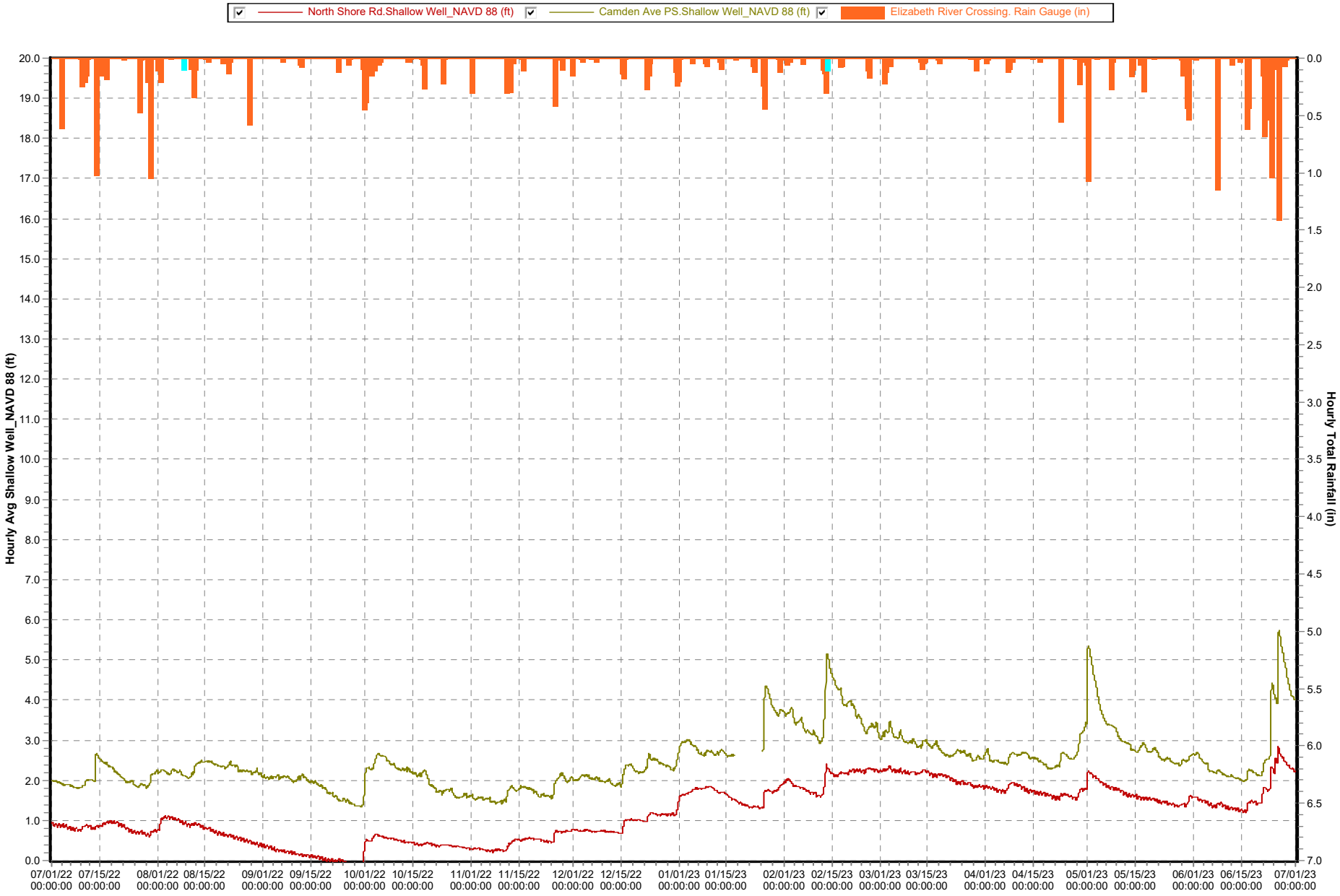


Teal showing invalid RG data

1-year

South Shore Shallow Well Graphs

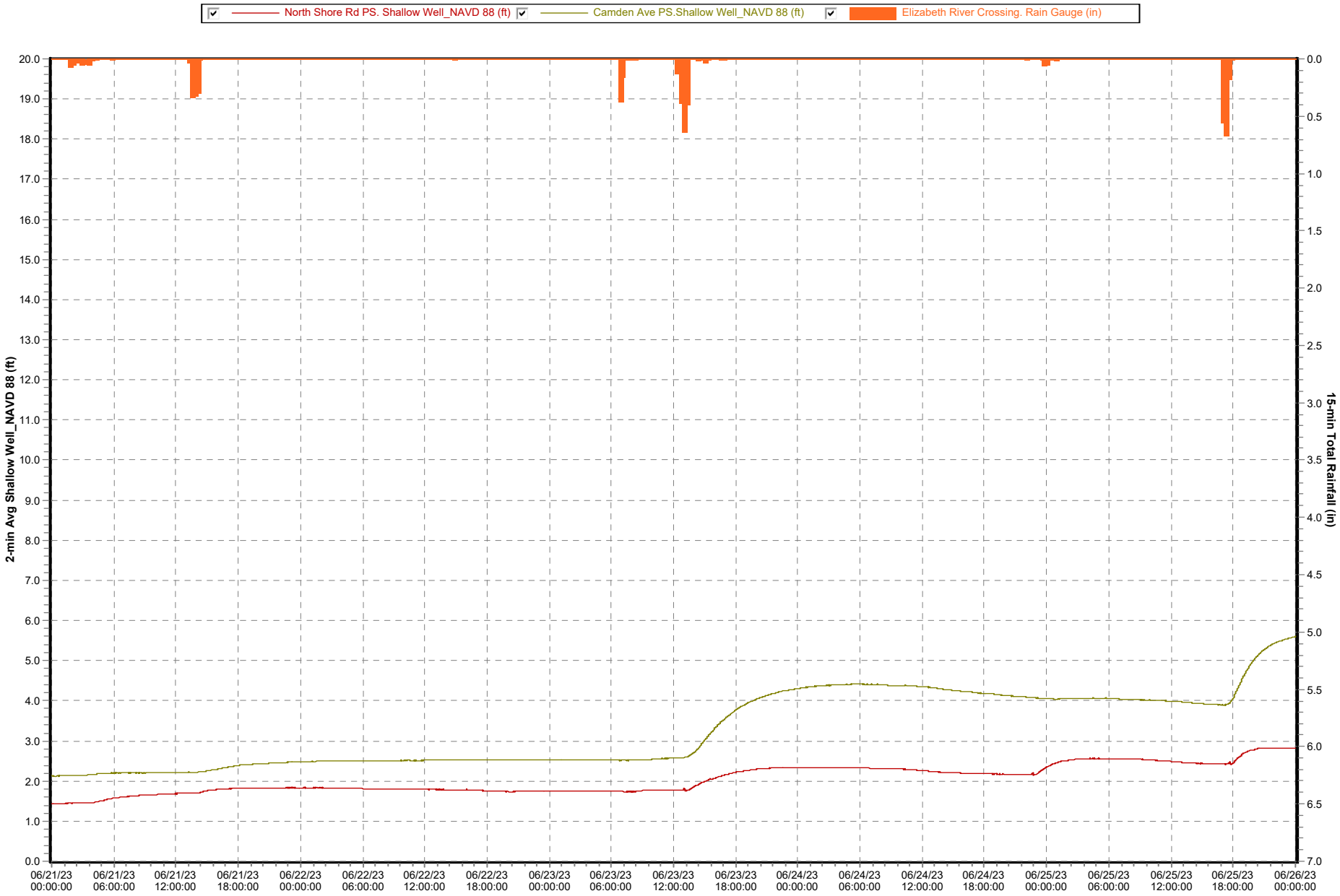
07/01/22 to 07/01/23



5-day

South Shore Shallow Well Graphs

06/21/23 to 06/26/23



Hampton Roads Sanitation District
Locality Only
Post-Storm Report

6/25/2023

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Summary

On June 25th, there was an approximate 2-hour pop up rainfall event that resulted in 0 sites on the North Shore and 1 site on the South Shore that met a 1-year rainfall recurrence interval throughout the HRSD rain gauge network. However, there was a Chesapeake Locality SSO. South shore rain gauges averaged around 0.5 inches of rain, with some sites seeing over an inch of rain during that period. In the week leading up to this storm, South Shore rain gauge sites had already averaged around 2.5 inches of rain. There was significant impact on groundwater levels compared to June 2022. See Appendix A for the Historical Shallow Well comparison. This will be a shortened report with information for the City of Chesapeake SSO event only.

No HRSD interceptor weather-related overflow(s) were reported.

One Locality interceptor weather-related overflow(s) were reported.

HRSD flow and pressure meters met data reliability requirements per the MOM program. For all pressure meters in the aggregate and all pressure-side flow meters in the aggregate for each treatment plant service area listed below, at least 90% reliable data was achieved, based on the duration of system response to this rainfall event. The data reliability for the gravity flow meters is not included in this synopsis.

- Duration of system response: See Table Below
- Aggregate flow meter validity: 99.84%
- Aggregate pressure meter validity: 99.10%

Currently, rainfall recurrence intervals are only analyzed for a maximum of 96-hours. Rainfall analysis begins after 0.1 inches of rain has occurred. A 72-hour dry period of less than 0.1 inches of rain is typically used to signify two separate events. However, if a site returns to "dry weather" conditions prior to the next rainfall that occurs within 72 hours of the previous event, it is also considered for separate analysis. See Appendix A for the Rainfall Total System Maps.

The current criteria for publishing a post-storm analysis are the following:

- One or more rain gauge sites meet a two-year or greater RRI (rainfall recurrence interval) and at least 50% of sites in any treatment plant service area receive one inch of rainfall or greater,
- A rain gauge site meets a five-year or greater RRI, or
- A weather-related SSO occurs.

Sanitary Sewer Overflows:

Localities

Location	Locality	Start Date
743 Providence Rd	Chesapeake	6/25/2023

South Shore

Weather:

Rainfall (HRSD Rainfall Gauges): *Recurrence intervals based on NOAA Atlas 14*

Rain Gauge Site	Peak Rainfall RI (Duration)	Locality
Atlantic Treatment Plant Service Area[1]		
Dozier's Corner PS	DNQ	CHES
Providence PRS	DNQ	VAB
VIP Treatment Plant Service Area[1]		
Elizabeth River Crossing_Eastern Branch	1-year (1hr)	NORF
Ferebee Avenue PS	DNQ	CHES

Note:

1. Typical treatment plant service area.

Tide:

- Sewells Point Tide Station:
  - Storm Surge: An approximate 0.8 foot storm surge was observed.

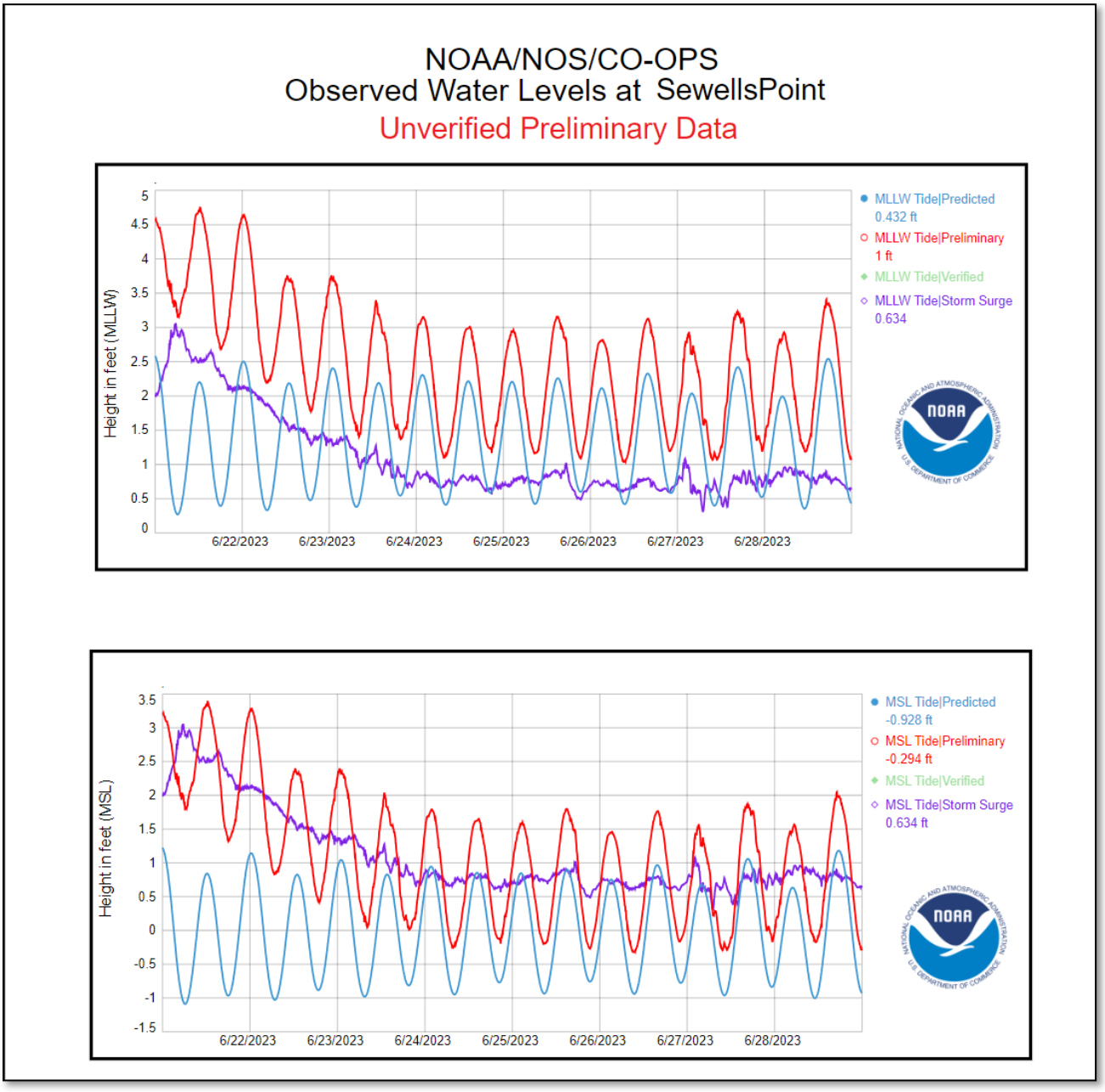


Figure 2. Preliminary data obtained from NOAA and a connection with Open Weather

Shallow Well Analysis:

Shallow wells are located at/or near HRSD Pump Stations to measure groundwater levels. The water column is measured using a pressure transducer located near the bottom of the well. The installed sensor measures gauge pressure in inches of water. The Shallow Well_NAVD88 measurement referenced in Appendix A refers to the elevation (referenced as NAVD 88) of the sensor plus the gauge measurement in feet.

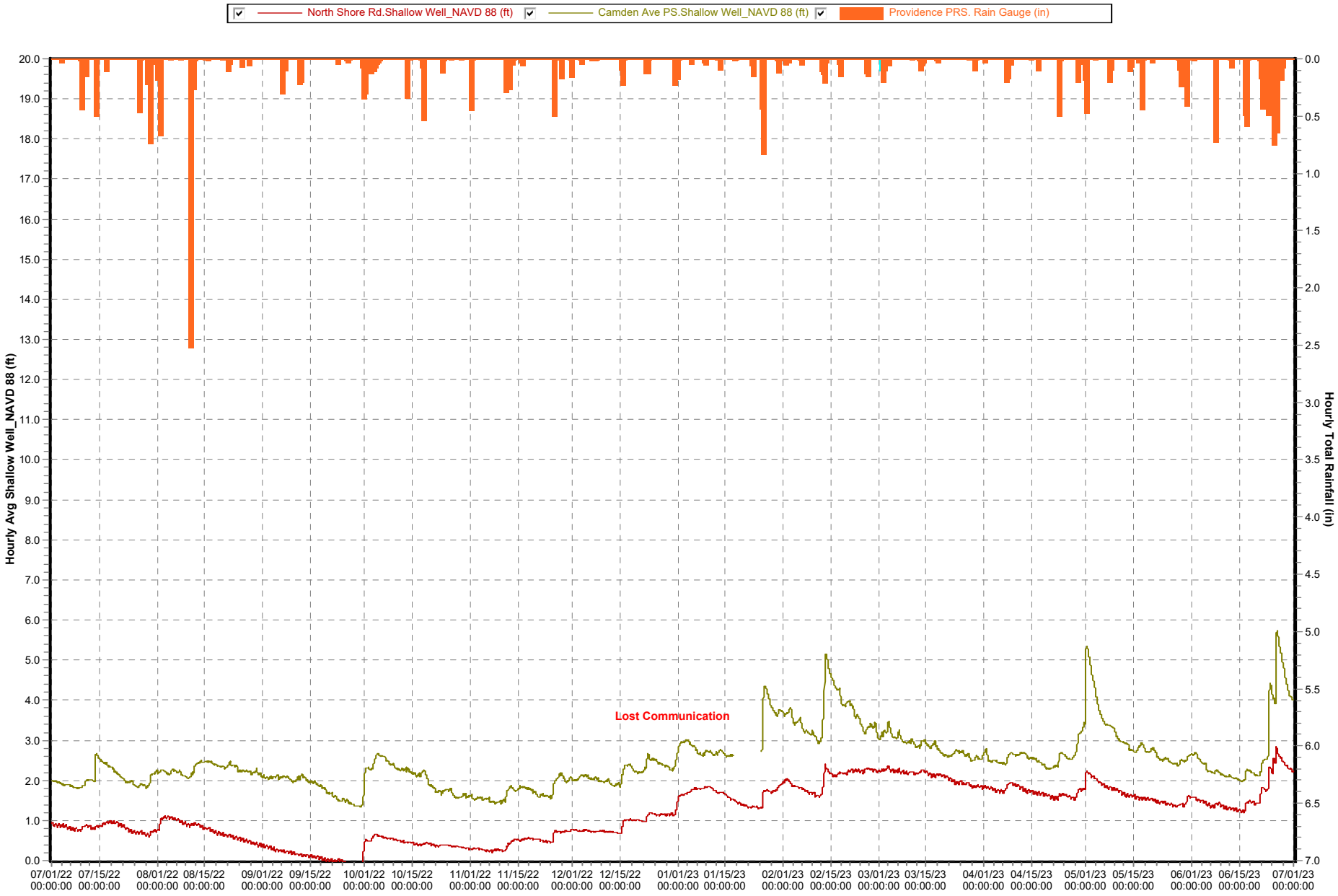
Appendix A

Shallow Well Analysis

1-year

South Shore Shallow Well Graphs

07/01/22 to 07/01/23



5-day

South Shore Shallow Well Graphs

06/23/23 to 06/28/23