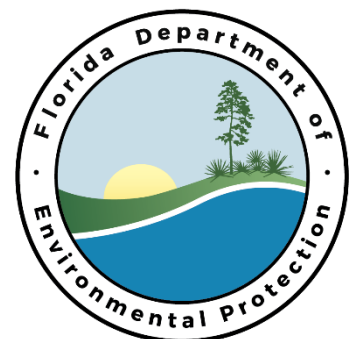


# INVESTIGATION REPORT REGARDING CITY OF ST. PETERSBURG'S SANITARY SEWER OVERFLOWS

Florida Department of Environmental Protection



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01/27/17

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## Executive Summary

As directed by Governor Rick Scott, the Department of Environmental Protection (DEP) performed the following investigation regarding the City of St. Petersburg's Sanitary Sewer Overflows (SSOs) during 2015-16. The investigation evaluated facts relating to civil environmental violations only and does not preclude any other investigation or prosecution of criminal law. The Florida Fish and Wildlife Commission is performing a separate investigation focused on any potential criminal activities related to the City of St. Petersburg's sanitary sewer overflows (SSOs).

In addition to evaluating causes of SSOs, DEP intends to work with St. Petersburg to find appropriate solutions to the causes of the violations. DEP is committed to fast tracking any applications for permits or revisions of existing permits to ensure that any improvements necessary to address the causes of SSOs are made as expeditiously as possible.

The DEP investigation has found many factors that have contributed to the St. Petersburg SSOs, including a lack of capacity at some of the treatment plants, excessive inflow and infiltration into the collection systems, the use of inaccurate or incomplete data from multiple sources (including population projections), and deficiencies in planning. It should be recognized that all wastewater facilities in Pinellas County had SSOs during the 2015-16 period -- some of the SSOs were significant in volume, but they were overshadowed by the volume discharged by St. Petersburg. The number of overflows in Pinellas County was in large part due to the high groundwater table in southwest Florida after a very rainy summer and the amount of rainfall combined with a high tide and significant storm surge. When the Southwest region of Florida is impacted by a hurricane, it typically is located on the quadrant of the hurricane with the greatest rainfall. This is particularly problematic in Pinellas County's low lying/low relief coastal areas. It should be noted that due to the nature of an SSO discharge, the volumes are difficult to precisely determine, therefore, over a period of time the quantities may vary.

The closing of the Albert Whitted Water Reclamation Facility (AWWRF) in April 2014 has been alleged as the reason for St. Petersburg's SSOs in 2015-2016. The closure of the AWWRF was a contributing factor to the SSOs, but the flows into the system could not have been completely managed even if the AWWRF facility had been functioning as a treatment plant during this period. The Northwest Water Reclamation Facility (NWWRF) did not receive additional flow due to the closure of the AWWRF, and yet it experienced overflows during 2016. This supports the conclusion that operation of the AWWRF would not have prevented SSOs in St. Petersburg during 2015-2016, but that it likely would have resulted in lower volumes of SSOs. However, the quality of the water and whether there would have been actual discharges to Tampa Bay are not known.

The Utility Department of St. Petersburg should have known as early as April 2012 that there could be problems managing the flow diverted from the Albert Whitted to the Southwest Water Reclamation Facility. They received a draft report dated April 16, 2012 from Brown and Caldwell concerning the capacity of the SWWRF. The report does not indicate the AWWRF should not be closed, but it does list several capacity deficiencies at the SWWRF that have not yet been corrected.

Lastly, polluted storm water runoff is commonly transported through Municipal Separate Storm Water Sewer Systems (MS4s) and then often discharged, untreated, into local water bodies. MS4s are not part of a sewage treatment plant, nor publicly owned treatment works (POTW). While MS4 permit violations were considered for the City of St. Petersburg, it is apparent from DEP's investigation that, since the city

does not manage its storm water and sewage in a combined arrangement, the root cause of the city’s sanitary sewer overflows is their extensive issues with Inflow and Infiltration and inadequate capacity. Therefore, it is the Department’s view that any MS4 violations will be fully addressed through the corrective actions established and included in the consent order.

**Brief History, Purpose & Methods**

During the period of July/August 2015 and during Tropical Storm Colin and Hurricane Hermine (collectively Severe Weather Events) in 2016, the City of St. Petersburg experienced large scale SSOs. By the end of Hurricane Hermine, the City of St. Petersburg was responsible for 51% of SSOs in the State of Florida for 2016 (see Table 1 below).

Table 1: Statewide SSO volumes versus St. Petersburg SSO volumes, 2011-2016.

Year	State Total (gallons)	Southwest Total (gallons)	St. Petersburg total SSO volume (gallons)	St. Petersburg SSO volume as a Percentage of statewide SSO volume
2011	80,379,247	20,634,132	784,305	0.98%
2012	49,903,760	18,776,358	286,295	0.65%
2013	156,921,572	49,362,341	1,321,190	0.84%
2014	181,774,696	25,427,852	156,235	0.09%
2015*	588,429,802	545,382,845	32,629,989	5.55%
2016 (as of 11/1/16)**	297,495,576	239,714,823	151,641,552	50.97%

\*Does not include large quantity of fully treated reuse water discharged by Pasco County

\*\* Discharge volumes for AWRWF during Hurricane Hermine were estimated to be between 78-93 million gallons, the numbers in this table are based on the lesser volume.

DEP evaluated permits, inspection reports, multiple engineering reports and discharge reports for each facility within St. Petersburg’s wastewater utility, as well as the entire collection system. Information contained in this Investigative Report was obtained, in part, from interviews conducted by DEP with the following individuals:

- Craven Askew, Chief Operator, NE Plant
- Janet DeBiasio, Water Quality Operations Specialist
- Tom Gibson, PE, Director of Engineering
- Steve Leavitt, PE, Director, Water Resources Department
- Steve Marshall, Energy Efficiency and Sustainability Manager
- John Palenchar, PE, Acting Director, Water Resources Department
- Evelyn Rosetti, MBA, Water Resources
- Sylvia Rosario, Chief Operator, NW Plant
- Kyle Soriano, Operator, NW Plant
- Claude Tankersley, PE, Public Works Administrator
- Ken Wise, Chief Operator, SW Plant

Based on these interviews, it is apparent that there are differences of opinion on various actions taken and on the role of various individuals in the decisions that were made, as would be expected. Many employees have long-standing relationships which may also color their opinions.

Numerous technical analyses of the St. Petersburg wastewater system have been prepared by contractors on behalf of the City. Generally, these reports tend to only look at parts and pieces of the overall system. A comprehensive system-wide technical analysis would be more useful moving forward. All technical reports and attachments referenced in this document are available on-line through the links in this document.

## Utility’s Organizational Structure

The following chart outlines the City of St. Petersburg’s Wastewater Utility chain of command.

<b>Mayor</b> Mayor Rick Kriseman (1/2/2014 - present) Mayor Bill Foster (1/2/2010-1/2/2014) Mayor Richard Baker (1/2/2001-1/2/2010)				
<b>Public Works Administrator</b> Claude Tankersley, PE Mike Connors, PE, previous				
<b>Water Resources Director</b> John Palenchar, PE, Acting Steve Leavitt, PE, previous George Cassady, PE, previous				<b>Engineering Director</b> Brejesh Prayman, PE Tom Gibson, PE, previous
Charles Wise, Manager	John Parks, PE	Steve Marshall	Evelyn Rosetti, MBA	Mike Rawley
Janet DeBiasio – Compliance Specialist				David Abbaspour
Dave Cindric – CS Supervisor				Phil Keyes
Craven Askew – NEWRF Chief				
Sylvia Rosario – NWWRF Chief				
Ken Wise – SWWRF Chief				

## Overview of St. Petersburg’s Facilities

The Sanitary Sewer Collection System in St. Petersburg consists of the following:

- 888 miles of gravity sewers with diameters ranging from 6”- 60”.
- 49.41 miles of force main
- 83 lift stations

- 78 lift stations connected to Supervisory Control and Data Acquisition (SCADA)
- 24 lift stations with fixed generators
- 41 private lift stations
- 18 portable generators
- 19,378 manholes
- 461 private manholes
- 97,932 connections (laterals)
- wholesale water service to six other entities.

Please see Attachment G or additional information on the St. Petersburg infrastructure.

There are three operating water reclamation facilities and one closed facility with a total permitted capacity of 56 million gallons a day, and a Master Reuse System, as listed below.

Table 2: St. Petersburg’s Water Reclamation Facilities; Capacities; DEP Permit Numbers

St. Petersburg Facilities	Capacity (in millions of gallons)	DEP Permit Numbers
Northeast WRF	16	FLA 128856
Northwest WRF	20	FLA 128821
Southwest WRF	20	FLA 128848
Albert Whitted WRF (closed 4/7/15)	(12)	FLA 128830
Master Reuse	68.4	FLA 012881

Each of these facilities is similar in design. The effluent from each of these facilities is discharged through the city-wide reclaimed distribution line and/or into deep injection wells, each of which has its own DEP permit. Effluent discharged to injection wells is required to meet high level disinfection and other parameters which protect the integrity of the injection well.

## Overview of Injection Well Systems in St. Petersburg

There are 4 facilities disposing of reclaimed quality wastewater in injection wells as described in Table 3.

Table 3: St. Petersburg's Injection Wells; Capacities; DEP Permit Numbers

St. Petersburg Facilities	Capacity (in millions of gallons)	DEP Permit Numbers
Northeast WRF	9.0	34361-005-UO/1M
	9.0	34361-006-UO/1M
	9.0	34361-007-UO/1M
Northwest WRF	32	33168-005-UO/1M
	32	33168-006-UO/1M
Southwest WRF	15	36855-013-UO/1M
	15	36855-014-UO/1M
	15	36855-015-UO/1M
Albert Whitted	24	34515-006-UO/1M
	24	34515-007-UO/1M

Reclaimed water meeting public access standards is the only water permitted for injection in all these wells. Each site has multiple wells for redundancy and to handle high seasonal flow rates.

The wells date to the late 1970s and the 1980s. St. Petersburg was the first injection facility in Florida to treat injected water to meet reclaimed water standards.

The depths for Class I well injection are approximately 640 to 1100 feet below land surface (bls). The ASR well stores reclaimed water at the depths of 490 to 600 feet bls.

Class I wells are inspected a minimum of once every two years, in addition to tests performed to demonstrate the mechanical integrity of the wells.

The injection wells record continuous pressure and flow rate. Injected water is sampled monthly for select salinity, nutrient, and biological parameters.

- Each injection well undergoes testing of its mechanical integrity every 5 years.
- Each facility has monitoring wells which are used to monitor the effect of injection upon overlying aquifers. Monitoring wells are sampled monthly for the same parameters as the injection wells. The pressure of the wells is continuously monitored.
- An annual summary of monitoring data with interpretation is required of all facilities and is submitted to the Department by September 1 of each year.

The following information was provided to determine compliance during the overflow events of Hurricane Hermine.:

- Well Pressure
- Gallons of Water Per Minute (GPM)
- Million Gallons Per Day (MGD)
- Total Suspended Solids (TSS)
- Fecal Coliform (fecal)

Information on injection wells can be found at the following links:

<https://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceec8525735900400c27/8929418832c82b7e852570bd00559c18!OpenDocument>

[https://www.epa.gov/sites/production/files/2015-10/documents/page\\_uic-class1\\_summary\\_class1\\_reqs\\_508c.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/page_uic-class1_summary_class1_reqs_508c.pdf)

<https://www.epa.gov/uic/class-i-industrial-and-municipal-waste-disposal-wells>

## Facility Analysis

### Northeast Water Reclamation Facility (NEWRF)

#### **1160 62<sup>nd</sup> Avenue NE**

The NEWRF is managed by Chief Operator Craven Askew (Mr. Askew). DEP staff (Mary Yeagan and Michele Duggan) interviewed Mr. Askew on October 4, 2016. The NEWRF did not experience any issues during the Severe Weather Events.

While the facility Mr. Askew operated did not experience issues during the Severe Weather Events, he also was interviewed regarding his September 13, 2016 whistle blower complaint.

In general, Mr. Askew revealed that as to engineering report access, Permitting and WRF Chief Operators were usually copied on engineering correspondence as it relates to their own facility, not others. For example, when the Albert Whitted (AW) was proposed to be closed and the flows redirected to the Southwest, only Ken Wise (Southwest) and Randy Curtis (Albert Whitted, retired) were involved in discussions and correspondence concerning the closure. Recently, that policy changed resulting in all Chief Operators being included on engineering correspondence no matter which facility was involved.

One of the engineering documents that lead to Mr. Askew's complaint was a July 31, 2014 [SWWRF Wet Weather and Liquid Process Capacity Assessment](#), by Brown & Caldwell (B&C). Mr. Askew first reviewed it on August 8, 2016. This B&C Report recommends that the City of St. Petersburg use 69 MGD as future peak hourly flow to determine the hydraulic and process capacities at the SWWRF; however, unless substantial upgrades were made at the SWWRF, the SWWRF could not accommodate a peak hourly flow of 69 MGD.

At the same time Mr. Askew was reviewing the 2014 B&C Report, he said that Janet DeBiasio, another utility employee, questioned him about a different 2012 hydraulic model report, also by B&C, which evaluated wet weather events. Mr. Askew was unaware of the existence of the 2012 report. Review of



the 2014 B&C documents led Mr. Askew to believe that the Albert Whitted was closed inappropriately and prompted Mr. Askew's whistle blower complaint.

Mr. Askew stated that Mike Connors ordered the AW decommissioning despite the aforementioned reports. Mr. Askew believes that the [SWWRF Wet Weather and Liquid Process Capacity Assessment](#) 2014 report was buried because it obliterated the cost savings upon which the city council based its decision to take AW offline. He said that numerous studies were done piecemeal which made it impossible to see the entire picture. Mr. Askew said he could bring the AWWRF back to service in six months. This opinion is not shared by the engineers who work for St. Petersburg. This is an antiquated facility that could have structural deficiencies that could cause costs to climb. When asked about constructing a new facility on the old site, Mr. Thomas Gibson explained there are constraints at the site. Rules require that any new facility must be constructed above the 100-year flood elevation and the location of the Albert Whitted is in the Special Flood Hazard Area inundated by the 100-year flood.

### **NEWRF – Underground Injection Wells**

- The Injection Well Network for the NEWRF had no violations for August and September 2016.
- The Injection Well Network (IW-2, IW-3) had no violations during July 2015.
- IW-1 – Exceeded 9 MGD injection flow rate (maximum 9.010 MGD), on July 28, 2015
- The Injection Well Network (IW-1, IW-2, IW-3) had no violations during August 2015.
- Notice of violation was reported on MOR for Flow, TRC, TSS, and fecal coliform for June 2016.

### **Northwest Water Reclamation Facility (NWWRF)**

#### **7500 26<sup>th</sup> Ave N.**

The NWWRF is managed by Chief Operator Sylvia A. Rosario. DEP staff (Mary Yeargan, Michele Duggan and Kelley Boatwright) interviewed Ms. Rosario on October 11, 2016. Ms. Janet DeBiasio, Water Quality Operations Specialist, also participated in the interview. On October 13, 2016, DEP staff (Michele Duggan) interviewed Mr. Kyle Soriano (Operator, works for Ms. Rosario). Steve Marshall was interviewed by DEP staff (Michele Duggan and Mary Yeargan) about the NWWRF on October 28, 2016.

According to Ms. Rosario and Ms. DeBiasio, there were some overflows at this facility during the last 10 years; however, none that compared to what was experienced during Hurricane Hermine. Ms. Rosario expressed absolute disbelief at the situation they experienced. Typical dry weather flow, which is predominantly sewage, for this facility is 10 million gallons/day and the facility is permitted for a 20 million gallons/day capacity. The highest daily wet weather flow during Hermine was 54.25 million gallons on September 2, 2016. The NWWRF had significant abnormal events during Hurricane Hermine, including partial filter bypass and storage tank overflow to the ground which caused offsite flooding. Ms. Rosario described how utility staff had to pump treated effluent from the chlorine contact tank into the storm water drains that lead to Jungle Lake to prevent added flooding.

Discharge reports submitted to the DEP and information from Ms. Rosario reveal that beginning on 8/31/2016 at 10 am until 9/9/16 at 6:30 am, the sand filters were hydraulically overloaded and were partially by-passed because the flow was cascading over the designed overflow wall into the effluent trough. This resulted in off-spec/reject water. A total of 220.51 million gallons of off-spec water was disposed of into the injection wells. The injection wells are permitted to receive 32 MGD, based on an annual average.

From 9/1/16 at 5 am to 9/4/16 at 11:30 pm, the NW flows exceeded the capacity of the holding tanks for the reclaimed and reject water. The excess water poured out of the vents at the top of both tanks ([See Figure 1](#)). The excess water initially collected in the grassy swale around the tanks, then flowed into the adjacent pond, and then south into the wooded area towards 22<sup>nd</sup> Avenue. The water was on the verge of flowing across 22<sup>nd</sup> Avenue and flooding the residential area to the south. To prevent this from occurring, pumps were used to divert the flow into the onsite storm water system which discharged north of 26<sup>th</sup> Avenue into Jungle Lake. As the flow increased, the sand filters in the facility were by-passed and the water was sent directly to the chlorine contact tank and then pumped to the onsite storm water system and then Jungle Lake. A total of 58 million gallons of off-spec water was discharged to Jungle Lake ([See Figure 2](#)).

Over this nine-day period, a total of approximately 278 million gallons of effluent with varying degrees of treatment were discharged, equivalent to 31 million gallons a day, three times the dry weather flow and a third more than the permitted capacity of the facility.

Figure 1. NWWRF reclaimed and reject water tanks overflowing



\*Photo taken during Hermine by a St. Petersburg employee and provide to the DEP by Ms. Rosario.

\*Click on the images above to view larger versions.

Figure 2. Locations of NWWRF reclaimed and reject water tanks overflow areas



\* Curved line shows direction of flow toward 22<sup>nd</sup> Avenue and residential area. Dotted line shows Jungle Lake north of 26<sup>th</sup> Avenue (flow was discharged to the lake through underground storm water piping).

According to Mr. Askew, Mr. Kyle Soriano, Ms. Rosario and Mr. Leavitt, on 9/3/16, due to the flooding, Steve Leavitt, Steve Marshall, and Charlie Wise met with the on-duty staff including Chief Operator Sylvia Rosario, Operators Kyle Soriano and John Turner, and Technician Chris Dilio. The three St. Petersburg managers/engineers told Mr. Soriano to cut the lock/chain on the valve for the un-permitted discharge pipe to Boca Ciega Bay and then open the valve to release the excess water. Mr. Soriano requested this directive in writing from Mr. Leavitt, which Mr. Leavitt provided ([Attachment R](#)). The valve was turned 1.5 turns (not opened all the way). Mr. Leavitt and Mr. Soriano then drove down 26<sup>th</sup> street and saw manhole(s) “overflowing or popping.” Mr. Leavitt telephoned the staff at the valve and said to close the valve. It is not clear why the partially treated effluent did not flow to the bay. DEP and various St. Petersburg employees think either it was high tide and the water pipe was filled to capacity, there were barnacles or other encrusting animals that have blocked the pipe, or the pipe had been filled with concrete. There was a new lock placed on the valve for the discharge pipe and the old cut chain left on the ground. On 10/13/16, the DEP discussed this event with Mr. Soriano. Based on a visual assessment, using the pictorial guidance provided ([Attachment F](#)), Mr. Soriano estimated the flow was greater than 275 gallons/minute and he said that one of the manhole covers was physically dislodged and was put back in place by Mr. Leavitt. Based on our discussion with Mr. Soriano, the DEP estimates a total of 13,750 gallons for this discharge. Ms. DeBiasio and Ms. Rosario confirmed the opening of the valve, but were not witnesses to the manhole overflows. When asked if this was a reported SSO, Ms. DeBiasio said the amount was so minor compared to everything else, it was included in the Discharge Report for the discharge from the large tanks. Mr. Marshall indicated that the decision to try opening the discharge pipe was made by Mr. Leavitt because Mr. Leavitt wanted to be able to tell his boss he had tried every possible alternative to having waters flood people’s homes.

Of note, the wastewater from St. Pete Beach is collected at this facility. There has been a significant increase in flow volume from St. Pete Beach over time which will be discussed in the Collection System Section of this report.

### **NWWRF Underground Injection Wells**

The Injection Well Network for the NWWRF had no violations during August 2016, but did experience violations in the below time periods:

- IW1 – Exceeded pressure limit, GPM, MGD (No flow rate or volume exceedances; Exceeded 70 psi pressure limit (maximum 72.4 psi), September 1-6.)
- IW2 – Exceeded pressure limit, GPM, MGD (No flow rate or volume exceedances; Exceeded 70 psi pressure limit (maximum 72.1 psi), September 1-6.)
- The Injection Well Network (IW-1, IW-2) had no violations during July 2015.
- The Injection Well Network (IW-1, IW-2) had no violations during August 2015.
- TSS limit exceeded was reported on MOR for June 2016.

### **High Level Disinfection Violations:**

TSS in the effluent was >5 mg/l on 9/2-3/16.

Fecal was present in 8 out of 30 samples. This was 26.7% of samples, which exceeds the maximum of 25% detections allowed per month. The maximum fecal value was 22, which is less than the single sample maximum limit of 25.

To put this into perspective, the Florida Healthy Beaches Program describes GOOD water quality as 1-199 fecal coliform/100ml. The fecal measure is used as an indicator of water quality, it does not differentiate between good and bad bacteria, just that bacteria is present.

### **Potential Violations:**

Rule 62-604.130(1), F.A.C., prohibits the release or disposal of excreta, sewage, or other wastewaters or residuals without providing proper treatment approved by the Department.

Rule 62-600.410(1), F.A.C., provides that all domestic wastewater facilities shall be operated and maintained in accordance with the applicable provisions of this chapter and related regulations so as to attain, at a minimum, the reclaimed water or effluent quality required by the wastewater facility permit.

Rules 62-600.410(3) and 62-604.500(3), F.A.C. provide that all facilities and equipment necessary for the collection, transmission, treatment, reuse and disposal of domestic wastewater and biosolids shall be maintained, at a minimum, to function as intended.

Rule 62-604.130(4), F.A.C., prohibits the unauthorized or deliberate introduction of storm water into collection systems and transmission facilities.

## Southwest Water Reclamation Facility (SWWRF)

### **3800 54<sup>th</sup> Avenue So.**

Mr. Ken Wise is the Chief Operator at the SWWRF. Mr. K. Wise has worked in some capacity at the SWWRF for 40 years. He was interviewed by DEP staff (Mary Yeargan and Michele Duggan) on October 20, 2016. A “100-yr storm event” occurred during July/August of 2015. Based on discharge reports and confirmed by Mr. K. Wise, during this storm event, an estimated 450 thousand gallons bypassed the headworks, going on to the ground, and 15 million gallons of sewage was discharged via pump from a lift station to a storm water pond that ultimately overflowed into Clam Bayou. The primary cause was purported to be Inflow and Infiltration to the collection system.

During Tropical Storm Colin and Hurricane Hermine, both in 2016, the headworks at SWWRF were again bypassed based on the notification required by rule and confirmed by Mr. Wise and Mr. Tankersley. Mr. K. Wise said that if the flow is over 40 million gallons/day, the influent overflows the headwork decks. When this happened during Hermine, the grit and rag compactor motors on the headworks were submerged and nonfunctional.

Mr. K. Wise stated that it is a complicated operation to bypass the headworks, coordinating the opening and closing of approximately 10 manual valves (the largest piping is 35”). Associated with the headworks there are 5 flow meters (2 from force mains, 1 from gravity pump station, and 2 are side stream). All 5 flow meters were eventually bypassed.

Based on Mr. K. Wise’s estimates, during Hurricane Hermine the SWWRF received a total flow of 65 million gallons in one day causing the effluent tank to overflow and 4 million gallons of effluent spilled on the ground from the chlorine contact tank. Mr. K. Wise indicated that the SWWRF provides Eckerd College with reuse water for their closed loop cooling system. Eckerd College returned 1.3 million gallons of water during Hermine which added to the volume. Currently by rule, this water must be retreated before it goes into the reuse system, even though it is clean reuse water.

Based on discharge reports provided to the DEP, from 8/31/16 at 7:25 am to 9/13/16 at 1:50 pm, 564.85 million gallons of off-spec effluent was pumped into the on-site injection wells. The injection wells were permitted to accept 15 million each per day and there are three completed injection wells whose permitted capacity over these 14 days would have been 630 million gallons. The permitted volume was exceeded on Injection Well #1, when the volume exceeded 15.76 million, the meter topped out and stopped functioning. All effluent pumps were running constantly for seven days, if they switched off from overheating, they were manually switched back on.

Mr. Wise said, “the flow came so FAST!” He said he had never seen these conditions in the over 40 years he had worked at the facility. As of 10/20/16, he was still pulling rags, bricks, asphalt pieces, and shells out of his plant. Mr. K. Wise said that to determine total flow during the Hurricane Hermine event, the meters on the injection wells were used and the SCADA for each tank was used to determine total volume. The SWWRF exceeded its treatment capacity by 29.5% capacity in September 2016.



The monthly monitoring report and Mr. K. Wise, in our discussion, stated the following:

Total flow for September	975.8	million
	54.26	maximum daily
	22.46	minimum daily
	32.50	monthly average
	20.00	permitted daily capacity

Mr. K. Wise said that the flow dropped to below permitted capacity on 10/13/16 (over one-month post storm), with a daily flow of 18.5 million gallons.

DEP asked his opinion of closing the Albert Whitted facility. He said that neither he, nor the other operators, thought it should close. Mr. K. Wise said he told Mr. Connors that the SWWRF would not be able to handle the diverted flows. Mr. Leavitt later confirmed, in his interview with DEP, that none of the operators agreed with the closing of the Albert Whitted facility and that they had shared their opinions with him prior to the closure.

#### **SWWRF Underground Injection Well Network**

- IW1 – Exceeded GPM flow rate September 1-10 (10,944 and limit is 10,416), but probably did not exceed all day. Exceeded 15 MGD volume limit September 1-8. No pressure exceedances.
- IW2 -- Exceeded GPM flow rater September 1-11(10,826 and limit is 10,416), but probably did not exceed all day. Exceeded 15 MGD volume limit September 1-8. No pressure exceedances.
- IW3 – No exceedances.
- The Injection Well Network (IW-1, IW-2, IW-3) had no violations during July 2015.
- The Injection Well Network (IW-1, IW-2, IW-3) had no violations during August 2015.
- The Injection Well Network (IW-1, IW-2, IW-3) had no violations during June 2016.

#### **High Level Disinfection Violations:**

- Daily TSS samples were not provided from September 1-13, 2016 on DMR Part B because the data was invalid because the filters were bypassed. However, TSS maximum for the month was provided on the DMR Part A (R-001). This was in compliance.

#### **Potential Violations:**

Rule 62-604.130(1), F.A.C., prohibits the release or disposal of excreta, sewage, or other wastewaters or residuals without providing proper treatment approved by the Department.

Rule 62-600.410(1), F.A.C., provides that all domestic wastewater facilities shall be operated and maintained in accordance with the applicable provisions of this chapter and related regulations so as to attain, at a minimum, the reclaimed water or effluent quality required by the wastewater facility permit.

Rules 62-600.410(3) and 62-604.500(3), F.A.C. provide that all facilities and equipment necessary for the collection, transmission, treatment, reuse and disposal of domestic wastewater and biosolids shall be maintained, at a minimum, to function as intended.

Rule 62-604.130(4), F.A.C., prohibits the unauthorized or deliberate introduction of storm water into collection systems and transmission facilities.

Figure 3. Video of Southwest Plant Chlorine Contact Tank overflowing during Hurricane Hermine



\* Video provided by Mr. Craven Askew. [Click here to view video.](#) Password is stpete.

### Former Albert Whitted Water Reclamation Facility (AWWRF)

**601 8<sup>th</sup> Avenue SE**

On December 15, 2011, the St. Petersburg City Council voted to close the Albert Whitted facility. This decision was based on two reasons: the inability of AWWRF to meet the requirements of Rule 62-528.300, Florida Administrative Code, which requires storage capacity for one day of effluent in the event the effluent does not meet advanced disinfection criteria, and approximately \$30 million in potential cost savings over 20 years, based on our discussions with Mr. Leavitt and newspaper interviews with the previous Public Works Administrator, Mr. Mike Connors.

A Southwest Water Reclamation Facility Capacity Analysis Report dated February 17, 2012 prepared by St. Petersburg utility staff (2012 SWWRF Capacity Analysis), indicated there was adequate capacity to manage a diversion of flow from the Albert Whitted to the SWWRF ([Attachment S](#)). The Summary and Conclusions of this report state that *“The SWWRF influent flows will increase by approximately 60% in 2014 when the AWWRF is scheduled to go off-line...daily flow will not exceed the SWWRF’s permitted capacity of 20mgd until year 2097.”*

The 2012 SWWRF Capacity Analysis further stated that “To ensure peak flows from both WRFs (Albert Whitted and SW) can be accommodated at the SWWRF, the City has contracted with Brown and Caldwell (B&C) consulting engineers to perform a hydraulic capacity evaluation of the SWWRF. Their evaluation will review data to estimate expected flow rates and develop a hydraulic model through the wet stream processes. The model will generate flow hydraulic grade lines and identify bottlenecks that create excessive hydraulic losses. The evaluation is scheduled to be completed in March 2012.” Mr. Gibson was interviewed by DEP staff (Mary Yeargan and Michele Duggan) on November 10, 2016. Mr. Gibson indicated that B&C was contracted to do this report because operators began noting higher flows, so the consultants were told to look over a greater time period for flow rates and rainfall.

A draft of this report was provided to St. Petersburg on April 16, 2012 and was called “[DRAFT Southwest Water Reclamation Facility Treatment Process and Hydraulic Evaluation](#)” which indicated that the Southwest plant may not be able to handle wet weather events from the combined flow of the SWWRF and AWWRF unless all the process units in the “new plant” were operational (i.e. until upgrades and improvements were made). Mr. Ken Wise said he was told this report was not to be shared. He did not know if the report was ever finalized. (Note, [the report was finalized 4/3/2013](#), but not shared with the DEP.) There were no significant differences in the draft and final report.

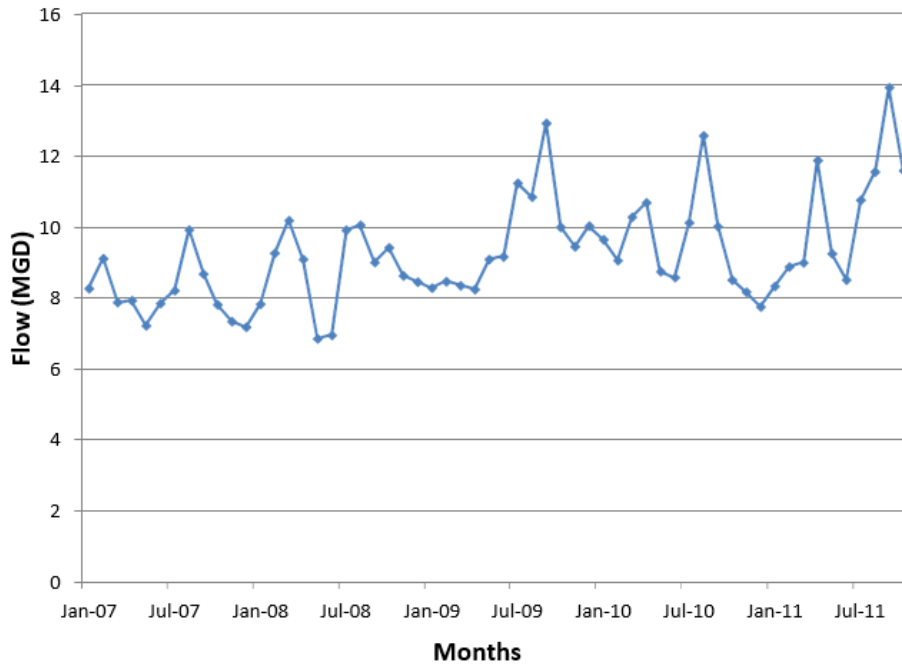
Mr. Leavitt worked in the Engineering Department beginning in December of 1999 and was promoted to the position of Director of the Water Resources Department in 2012. When asked about the closure of the Albert Whitted facility he stated that based on what they knew at the time he believed it was an appropriate decision.

Mr. Leavitt said their first indication of a problem was in June 2012 when Tropical Storm Debbie affected the Tampa Bay Area. The flows into the plants increased significantly. However, the April 16, 2012 [Draft Report Hydraulic Model prepared by Brown and Caldwell](#) (finalized in April 3, 2013) discussed by Mr. Ken Wise indicated that several factors would limit the capacity of the SWWRF including but not limited to:

- The effluent pumping system and deep injection well is ~27 MGD, which will limit the hydraulic capacity of the SWWRF.
- The secondary clarification system limits capacity to 17 MGD
- The aeration system, filtration and disinfection facilities capacity exceeds 20 MGD (annual average daily flow (AADF)), but if nitrification occurs, the capacity of the aeration system is limited to 15MGD AADF.
- Influent flows to the SWWRF have steadily increased by 28% during the period of 2007 to 2011. See Figure 4 below.
- Headworks pipe is limited due to insufficient diameter

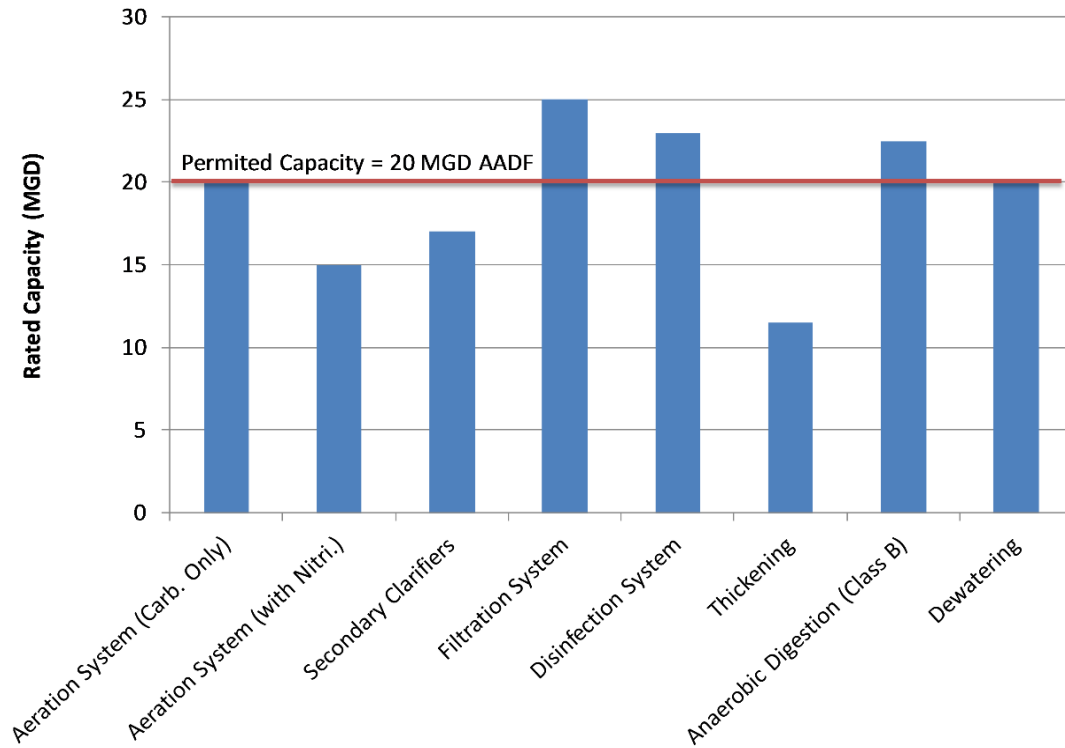


Figure 4. Monthly Average Flows to the SWWRF



April 3, 2013 B&C Report

Figure 5. Summary of Treatment Process Capacity Evaluation Results



April 3, 2013 B&C Report

Mr. Leavitt said Tropical Storm Debby prompted additional studies; however, this April 3, 2013 B&C Report likely lead to the July 31, 2014 [SWWRF Wet Weather and Liquid Process Capacity Assessment](#) (B&C, not signed or sealed) where it was recommended that the city use 69 mgd as future peak hourly flow to determine the hydraulic and process capacities at the SWWRF, which was discussed in the Whistle Blower Complaint. Mr. Gibson indicated that the design of the proposed Biosolids project was enhanced to include the necessary changes to increase capacity at the SWWFRF.

Mr. Leavitt was asked if he felt pressure to close the AWWRF for redevelopment and he said that the last political pressure was in 2003 when there was a city-wide referendum regarding closure of the airport and, therefore, the AWWRF. The closure was soundly defeated. He said that more recently it was quite the opposite, he thought no one cared about the AWWRF or any other wastewater issues. He said that most presentations and proposals to the City Council were simply placed on the Consent Agenda and approved with no discussion. Note that two of eight commissioners voted no to the closure of the AWWRF.

The DEP discussed the closure of the AWWRF with Mr. Gibson. Mr. Gibson started with the city in 1988 as the Manager of the Construction Program and was quickly promoted to the Assistant Engineering Director. He has been the Engineering Director for the last eleven years. He has responsibility for engineering and capital improvements. His department does design, permitting, and construction for roads, bridges, landscaping, and MS4 permits. He permits in the right of ways, and he has responsibility for 78 school crossing guards. With regards to the wastewater treatment plants, the engineering department has never done an actual design; the design work is completed by consultants that he oversees. His department manages the contractors implementing the construction and does the actual construction inspections.

He said that he was not involved in the question of the closure of the AWWRF. His responsibilities are design and construction, not operations. He said that Mr. Conners and Mr. Levitt made the decision. Mr. Gibson said that that no one ever asked or called questioning closure of the AWWRF. He stated that the AWWRF could not manage reject water, that the old plant had hydraulic issues, and Mr. Conners was concerned that a 30-year flood event would overflow the AWWRF. He also stated that the city experienced budget cuts for eight years and the Utility Department needed to save money. He said that Mr. Conners saw the closure as an opportunity to save \$3M/year when the budget was difficult to manage.

The DEP asked Mr. Gibson if the AWWRF should be torn down and redesigned as a more modern facility. He said while that was an option, the existing property would need to be raised to meet the 100-year flood elevation plus 2 feet, so it would have to be approximately 11 feet above the existing grade, which could be a problem due to the proximity to the airport.

There were six permits issued by DEP for the diversion of flow from the AWWRF to the SWWRF:

Permit No.	Permit issue date	Clearance Date	Permit Details
CS52-0139468-067	8/20/2012	11/5/2014	Serve existing development w/30-inch and 36-inch FM. No additional flow to SW.
CS52-0139468-068	8/20/2012	11/5/2014	Serve existing development w/30-inch FM. No additional flow to SW.
CS52-0139468-069	9/18/2012	11/5/2014	Lift Station #85 construction only (does not include ~37,000 lf or 30-inch FM). Includes additional flows to SW.
CS52-0139468-070	9/27/2012	11/5/2014	Dry line permit for 30-inch FM from AW to SW. No additional flow to SW.
CS52-0139468-071	9/20/2012	11/5/2014	Serve existing development w/30-inch FM. No additional flow to SW.
CS52-0139468-074	11/2/2012	11/5/2014	7,900 lf of 30 inch FM, 4,850 lf of 24-inch FM with 25 manholes. This is the permit in which the AW flow transfer to SW is included.

These permits enabled the construction of a new Master Lift Station #85 and the conveyance of wastewater from the AW service area to the SW facility using a new 2.4-mile pipeline.

By May 2013, the construction of the lift station and piping to convey the wastewater from AW to SW was initiated and was part of a \$35 million project. In an interview with the Tampa Bay Times ([Attachment H](#)), *“Public Works Administrator Mike Connors said the project has environmental and financial benefits. It also has the advantage of freeing up 7 acres of waterfront property and eliminating a very vintage facility that could be damaged by hurricanes and tropical storms, he said. The work that began in May and is expected to be complete in 2015, will save the city more than \$30 million over 20 years, Connors said. The savings will come primarily from reduced maintenance and operation costs at the aging Albert Whitted plant, which will be decommissioned in 2015, he said.”*

Mr. Gibson said during testing of the Lift Station #85, they took the AWWRF down to half flow and it was difficult to keep the biological system alive. During the testing of Lift Station #85, they had to rethink their strategy and it took four months to go off line. This may have influenced some of the operational decisions.

As noticed to DEP, the AWWRF received the last wastewater on April 7, 2015. With the closure of the plant, the injection wells located at AWWRF were repurposed to only accept excess reuse water from the reclaimed distribution line that circles the city. Additionally, the pumps and other usable equipment at the plant were removed for use at the other facilities.

A “100-yr storm event” occurred during July/August of 2015. Due to the excessive flows at the SWWRF, the AWWRF was partially reactivated, discharging 105 million gallons into Tampa Bay after basic chlorination.

June 2016, Tropical Storm Colin passed St. Petersburg. Due to the excessive flows at the SWWRF, the AWWRF was again partially reactivated initially for storage only, but they ultimately discharged 9.7 million gallons into Tampa Bay after basic chlorination.

From 08/30-09/03/16, during Hurricane Hermine, the AWWRF was reactivated to manage the excessive flow of wastewater to the SWWRF, initially for storage only, but they ultimately discharged between 78 and 93 million gallons of chlorinated wastewater into Tampa Bay.

### **AWWRF – Underground Injection Wells – September 2016**

- IW1 – ok for pressure, GPM, MGD, TSS and fecal
- IW2 – ok for pressure, GPM, MGD, TSS and fecal  
these wells are only used for injection of Reuse Water

### Potential Violations

Rule 62-604.130(1), F.A.C., prohibits the release or disposal of excreta, sewage, or other wastewaters or residuals without providing proper treatment approved by the Department.

Rule 62-600.410(1), F.A.C., provides that all domestic wastewater facilities shall be operated and maintained in accordance with the applicable provisions of this chapter and related regulations so as to attain, at a minimum, the reclaimed water or effluent quality required by the wastewater facility permit.

Rules 62-600.410(3) and 62-604.500(3), F.A.C. provide that all facilities and equipment necessary for the collection, transmission, treatment, reuse and disposal of domestic wastewater and biosolids shall be maintained, at a minimum, to function as intended.

### Collection System for St. Petersburg

The City of St. Petersburg has the largest collection system in Pinellas County. Numerous overflows from manholes were reported during these rain events, which can be cause from blockages, excessive water, etc.

In addition to treating wastewater from St. Petersburg, the collection system accepts wastewater from other municipal customers ([Attachment E](#)) including:

- Gulfport
- St. Pete Beach
- Treasure Island
- S. Pasadena
- Ft. Desoto and Bear Creek
- Tierra Verde

During the 1990s St. Petersburg had a significant problem with sanitary sewer overflows. Because of these overflow events, EPA and DEP were engaging in enforcement actions that resulted in a DEP Consent Order in the year 2000. St. Petersburg completed a number of improvements in their treatment and collection systems. In 2007, the Florida Water Environmental Association honored St. Petersburg for their collection system naming it the best in the state for systems with more than 50,000

customers. A copy of an article on the improvements to the collection system can be found at the following link: <http://www.cuesinc.com/pdf%20docs/M0510%20St.%20Petersburg%20Profile.pdf>

It now appears that the El Nino rains of the 1990s and current El Nino rains contributed greatly to the overflows. See the following websites for information on El Nino and its effect on the Southeastern U.S.  
<https://www.weather.gov/tae/enso>  
<http://www.earthobservatory.nasa.gov/Features/WorldOfChange/enso.php>  
<https://weather.com/news/climate/news/strong-el-nino-noaa-update-november2015>

As St. Petersburg worked to correct its inflow and infiltration problems, required by the DEP Consent Order 97-0134, a drought ensued that made it more difficult to gauge the actual success of the work. The drought significantly lowered the groundwater level reducing that source of inflow/infiltration into the collection system and, because of the drought, there was less storm water being introduced through manholes and infiltration into the ground. When Mr. Leavitt was questioned about the current inflow and infiltration problems he said that in hindsight, he believes they gave too much credit on the Inflow and Infiltration improvements.

Table 4: Inflow to the facilities in St. Petersburg during and after Hurricane Hermine (2016)

Facility	Dates	FLOW TOTAL MG	~ daily flow MGD	Permitted flow MGD	Dry weather flow MGD*
NWWRF	9/1- 9/9	278	31	20	10
SWWRF	September 2016	975.8	22-54	20	18.84
NEWRF	8/31-9/9	135.72	16-23	16	8.85
AWWRF	8/30 - 9/6	>100	25	None	None

\*DEP and St. Petersburg estimates based on average winter flow rates (non-rainy season)

The data in Table 4 clearly demonstrates the effects of the inflow and infiltration of groundwater and storm water on flow in the collection system. Every facility was above their permitted capacity during and after the storm, daily flow at the NWWRF tripled over dry weather flow. The SWWRF was over their permitted flow for a full month and at times more than double their permitted flow, and while the NEWRF did not have any overflow, it exceeded its permitted capacity during Hermine.

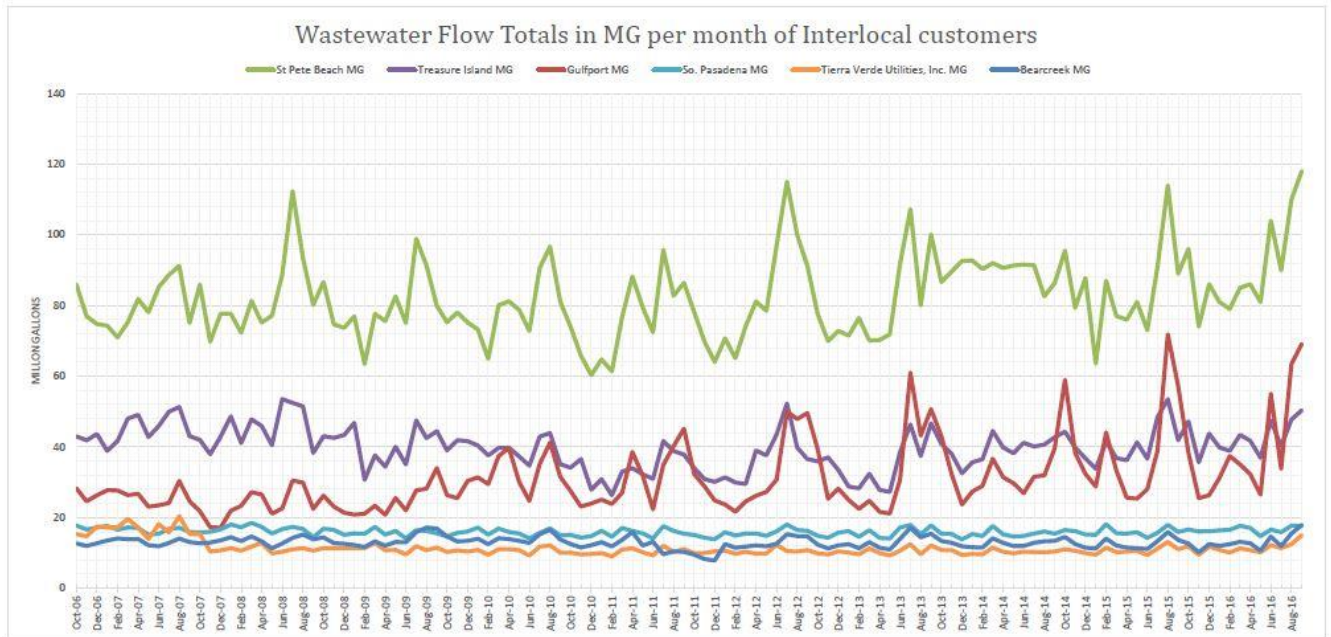
A *preliminary* report was made to the City Council on October 20, 2016, by consultant CH2M, that stated 45-50% of the piping in the collection system needs repair (480-528 miles of piping) and that 15% of piping is in dire need of repair (144 miles). It was estimated that 10-15% of the rain that fell during Hermine ended up in the sanitary sewer system, normal expectations and industry standards allows for 0-5% of rainfall to enter the sanitary sewer system. Prior to Hurricane Hermine, St. Petersburg was planning on investing \$37.25 million on repairs over the next five years to the collection system. By the October 20<sup>th</sup> meeting, the commitment was made to invest \$92.5 million over the next 5 years in the collection system.

It has also been reported during some of our interviews that an unnamed member of the utility staff said that maintenance workers for the St. Petersburg Storm Water Department were overheard communicating on radios and being told to open manholes to reduce flooding in intersections. The DEP has no evidence of this, however, if this is true, it is a violation of Rule 62-604.130(4), Florida

Administrative Code, which prohibits the unauthorized or deliberate introduction of storm water into collection systems and transmission facilities.

It is also known that some of the interlocal customers have serious inflow and infiltration problems. Figure 6, provided by the City of St. Petersburg, illustrates the amount of wastewater flowing in to St. Petersburg's collection system from October 2006 to August 2016. There have been significant increases in total volume from many of these customers over that time period.

Figure 6. Monthly Wastewater Flow Totals from Interlocal Customers



\*Click on the image above to view a larger version.

### Potential Violations

Rule 62-604.130(4), F.A.C., prohibits the unauthorized or deliberate introduction of storm water into collection systems and transmission facilities.

Rules 62-600.410(3) and 62-604.500(3), F.A.C. provide that all facilities and equipment necessary for the collection, transmission, treatment, reuse and disposal of domestic wastewater and biosolids shall be maintained, at a minimum, to function as intended.

### Summary

The Operators and employees at the wastewater facilities should be commended for their hard work and the dedication they showed during these tropical rain events. They worked incredibly long hours in very unpleasant and hazardous conditions, all the time trying to minimize the overflows from their facilities. It is clear they take their licenses and obligations very seriously.

St. Petersburg's wastewater collection and treatment system is not in good repair and it will take time and an extraordinary capital investment to correct this situation. This is mirrored in many cities across the nation. A significant contributing factor is the poor condition of the collection system, both public

and private, that overloads the systems with groundwater and storm water. Cities whose development took place prior to 1975 are plagued with collapsed and broken piping, because the construction materials were not adequate for long-term use. The AWWRF was taken off-line prematurely. The analysis of the impact of closure was poorly evaluated. The earliest reports were overly optimistic and used incomplete, dated, or erroneous data and later reports were not taken seriously enough. Based on our interviews, it was unclear what the driver was for the haste in closing the Albert Whitted. Some felt that there was such a minute chance of an extraordinary rain event it was not worth slowing down major upgrades (this was outlined in an October 25, 2016 memo to Mayor Kriseman from Mr. Leavitt and is in [Attachment X](#)). Some mentioned interest in seeing successful implementation of the [Biosolids Digester project](#) as the driver, while others felt it was influence from developers. Still others thought it was pressure through time from various mayors, while some believed that budget reductions were a major factor.

## Recommendations

Complete upgrades as outlined in the draft Consent Order 16-1280 on a fast track schedule. Please see the following recommendations. There are other upgrades that are necessary, but these are critical at this juncture:

### Albert Whitted:

Evaluate the feasibility of reopening the Albert Whitted facility. This evaluation must include a plan and time frames for construction of reject water storage or plans to build the plant to Advanced Wastewater Treatment Standards for any necessary discharges to Tampa Bay. Alternately, the city may consider building a state-of-the-art wastewater treatment plant in another location.

### Southwest Plant:

- Splitter Box for the Headworks
- Install Disc Filters for moving flow out of plant faster
- Enlarge Chlorine Tank
- Complete new injection wells and enlarge piping
- Evaluate postponing the startup of the Biosolids facility until the collection system repairs are completed or at least completed in the portion of the system that will transmit biosolids

### Northwest Plant

- Complete a Capacity Study for wet weather events
- Install additional filters
- Complete new injection well(s)

### Northeast Plant

- Evaluate transferring some of the AWWRF basin's flow to the NEWRF

### Collection System

- Prioritize and reduce the inflow and infiltration from collection system and from customer collection systems. Find avenues to reduce the inflow and infiltration from private laterals.
- Pressure the wholesale customers to repair their collections systems.
- Regulate Private Collection Systems (City of Largo has program in place), up to and including flow meters on private lift stations.
- Pass an ordinance prohibiting illegal connections to the wastewater collection system and top management in St. Petersburg must ensure that there is a cooperative relationship between storm water and wastewater departments.



- The SCADA system must be upgraded to provide useful information on flow and not just run times.

## Appendix I: Timeline for Documents, Reports, Memos and Events

- 10/19/2002: [St. Pete Times article](#) on Mayor Baker's plans to alter the Albert Whitted Airport and mentions that city officials considered tearing down the Albert Whitted WRF but a consultant said the cost would be \$55-65 million.
- 2003: General election when 77 percent of St. Petersburg voters decided to keep the airport in operation, rather than cede the property to the city for a waterfront park and development.
- 10/2010: [AWWRF Operation Alternatives Report](#) (CDM, signed and sealed) –. The report evaluates three options for AWWRF to meet a regulatory requirement to provide storage for reject reclaimed water: Keep AWWRF operational and obtain land for reject storage, divert flow to SWWRF, or divert flow to NWWRF and SWWRF. The report describes the AWWRF as fragile, antiquated, and near obsolescence. CDM recommends diverting flow to SWWRF as the lowest cost alternative. The report also states the dual diversion option to the NWWRF and the SWWRF would provide flexibility and reliability to deal with future flows but because these were not normally considered for wastewater design, the increased cost could not be justified. A peaking factor of 3 was used for pump and pipe sizing (not facility capacity) and was based on recent flow data because of the city's "efforts to better seal its aging sewer" against I&I.
- 12/15/2011: City council votes 5:2 to take AWWRF offline. Mayor Foster speaks, indicating population projections were good for the next 20 years, mentions UIC regulations and how they limit AWWRF.
- 2/17/2012: [Southwest Water Reclamation Facility Capacity Analysis Report](#) prepared by St. Petersburg Utility Staff that said there was adequate capacity to manage the AWWRF flow at the SWWRF. It has one line that mentions the peak hour flow would exceed the 40 mgd maximum day rate and mentions that another report was to be completed in March 2012 to look at the wet weather events.
- 4/16/2012: [DRAFT Southwest Water Reclamation Facility Treatment Process and Hydraulic Evaluation](#) indicated that the Southwest plant could handle peak flows from the combined flow of the SWWRF and AWWRF if all the process units in the "new plant" were operational. Mr. Ken Wise said he was told this report was not to be shared. He did not know if the report was ever finalized. (Note, the report was finalized 4/3/2013.)
- 6/24/2012: Tropical Storm Debby caused heavy rainfall in Florida.
- 04/3/2013: [SWWRF Treatment Process and Hydraulic Evaluation](#) (B&C Final, signed and sealed) - Establishes the maximum treatment capacity for SWWRF to meet the existing effluent requirements including the flows and pollutant loadings from AWWRF, included planning and recommendations to eliminate hydraulic and treatment process



bottlenecks at SWWRF to handle its permitted capacity of 20 MGD. The capacity of the effluent pumping system and deep injection wells is 27 MGD, which will limit the hydraulic capacity of the SWWRF. Emphasis was given for the selection of design conditions, to CBOD5 and TSS loadings, as they have the strongest influence on plant operations. Existing SWWRF – Hydraulic profile for the current permitted AAF (20 MGD) and peak hour (40 MGD) flow conditions with 18 MGD of RAS flow. The modeling shows the SWWRF to be capable of hydraulically passing the flows at both flow conditions using only the “new plant.” The hydraulic capacity of the SWWRF was determined to be adequate, assuming the process units maintain adequate freeboard during peak flows and did not submerge any flow controlling weirs (aeration basin and clarifier splitter boxes/weirs). Bottleneck potential were identified as the influent flow meter location after headworks: 48-inch pipe reduced to 30-inch for the flow meter generating significant head loss at peak flows. Might need to relocated flow meter.

- 07/22/2013: Email exchange between city employees – John Parks: need to increase reclaimed water pumping capacity at SW by the time AW flows are transferred, and to have a consultant evaluate options.
- 09/16/2013: [Biosolids to Energy Project Preliminary Design Report Draft \(B&C\)](#) - Recommended design flows for NWWRF = 10.11 mgd, NEWRF = 11.57 and SWWRF = 20.00 at a minimum. Recommended plant upgrades at SWWRF to be designed for its current capacity (20.0 mgd). Flow information from 2009-2012 data was used to develop design flow peaking ratios (same as the 2013 hydraulic evaluation) . Model showed that SWWRF is capable of hydraulically passing a peak flow of 40 mgd, but a significant hydraulic bottleneck at the influent flow meter may make it difficult to install primary clarifiers downstream of the headworks. BioWin model indicates that aeration capacity may be issue with increased sidestream nutrient loading from processing SW, NW and NE sludge.
- 01/02/2014: Mayor Kriesman takes office.
- 01/10/2014: [SWWRF Reclaimed Water Pump Station Modifications](#) (CDM, initialed memorandum) - Evaluation of two options to increase the reclaimed water pump station capacity, based on the relocation of two existing pumps from AWWRF to SWWRF. Option 1 – Relocate two existing 450 HP pumps from AWWRF to SWWRF. The total pumps will be five. There will be three 250 HP pumps and two 450 HP pumps. Option 2 – Relocate two existing 450 HP pumps from Albert Whitted while retaining the existing five pumps. There will be five 250 HP pumps and two 450 HP pumps. “Between the time that flow is diverted and the time that the relocated pumps are placed into service at the SWWRF, there is a potential for an occurrence of peak wet weather flows at SWWRF in excess of reclaimed water pumping capacity.”
- 07/31/2014: [SWWRF Wet Weather and Liquid Process Capacity Assessment](#) (B&C, not signed or sealed) B&C recommends that the city use 69 mgd as future peak hourly flow to determine the hydraulic and process capacities at the SWWRF. The report includes actual up-to-date 2012 and 2013 flow data for the combined AWWRF and SWWRF that indicates peak flows higher than the SWWRF current design. Three alternatives

involving substantial modifications are recommended to upgrade the SWWRF to handle peak flows.

- 12/10/2014: AWWRF began transfer to SWWRF.
- 04/07/2015: AWWRF completely diverted to SWWRF. Reject tank at SWWRF not yet built. City immediately began dismantling AWWRF.
- 06/19/2015: [Biosolids to Energy Project Preliminary Design Report Final](#) (B&C) - Primarily looked at the solids treatment and stabilization process, with only a brief mention of the hydraulic flow issues. It includes the updated flow peaking factors from the SWWRF – Wet Weather and Liquid Process Capacity Assessment (B&C, 07/31/2014). The historical flow data from the 2012-2013 period showed a maximum wet weather flow contribution in excess of the dry weather flow of approximately 43.2 MGD. Assuming the maximum dry weather flow and the storm flow occur at the same time, the total projected flow to the SWWRF was estimated to be 68.7 MGD (25.5 MGD + 43.2 MGD). A rounded figure of 70.0 MGD will be used for the Biosolids to Energy Program.
- 10/07/14: [Article in the CrowsnestSt.Pete.com](#) states, Albert Whitted is in danger of extinction once again. Mayor Rick Kriseman told the *Tampa Bay Times* that he doesn't feel the airport is the best use of the waterfront land. The city of St. Petersburg is drafting a new Downtown Waterfront Master Plan in conjunction with Urban Land Institute, with adoption goal of July 1, 2015.
- 07/01/15: Downtown Waterfront Master Plan includes the former Albert Whitted WRF as a Transformation portion of the redevelopment.
- 07/29/15: SWWRF permit revision issued, authorizing construction of components of the Biosolids to Energy project.
- 07-08/2015: Unnamed 100-yr storm event, AWWRF reactivated, discharging 105 mg of partially-treated effluent into Tampa Bay. At SWWRF, an estimated 450 tg bypassed the headworks and 15 mg were discharged to Clam Bayou. City continued to demolish AWWRF.
- 09/03/2015: City council meeting – council requested study
- 09/24/2015: Mike Connors retires.
- 10/23/2015: [Final TM #1 – Solids Facilities Observation Memorandum](#) (CH2M, not signed or sealed) – incorporated into final peer review
- 10/27/2015: [Final TM #2 – Validation of Plant Solids Loadings Parameters and Plant Capacity](#) (CH2M, not signed or sealed) – incorporated into final peer review.
- 11/30/2015: [Final TM #3 – Validation of Solids Process Selection and Supporting Analysis](#) (CH2M, not signed or sealed) – incorporated into final peer review.

- 11/2015: [Flow Projections and Liquids Processing Facilities Hydraulic Review](#) (CH2M, not signed or sealed) – This peer review validates the identified bottlenecks at the SWWRF and lack of disposal capacity (UIC wells). The report includes a summary of peak flows from 2000 to 2015 for the combined flow from SWWRF and AWWRF greater peak flows.
- 12/14/2015: [Wastewater Projects Peer Review](#) (CH2M,)- Companion peer review with previously cited study. This review validates the assumptions and analysis used in the process selection of the Biosolids to Energy Project.
- 06/03/2016: TS Colin – AWWRF reactivated, discharging 9.77 mg into Tampa Bay.
- 06/17/2016: Meeting between DEP and City to discuss 2015 and TS Colin discharges. DEP told City that a consent order will be necessary to resolve the ongoing issues.
- 07/08/2016: [AWWRF Restart Evaluation Technical Memorandum](#) (Carollo, signed and sealed) - Evaluations of different options for keeping AW in service or decommissioning.

*Items of interest in report:*

- Lift Station 85 – could receive sludge from the AW facility for pumping in the influent waste stream (sewer) to the SW facility. The report doesn't say how this will be addressed during wet weather high flow conditions. However, it does say an option is to have the solids transported off-site for treatment and disposal.
- Existing wastewater discharge pipe to Tampa Bay is referenced.
- Discussion of the continued utilization of the AW facility for more storage is provided.

*Options*

1. Continue to use AWWRF tankage for wet weather storage. [This is the quickest, least expensive, might not work.]
2. Restart AW to treatment capability – Is an issue with continued use of UIC for reject. [This has a higher cost than option 1 and will take longer to accomplish.]
3. Convert AW to an AWT facility with an NPDES discharge to Tampa Bay. Final design capacity (10 MGD) is less than the previous permitted capacity (12.5 MGD). [This has a significant higher cost and would need a long-term existence to make it cost effective.]

*Carollo recommended Option 1 - continuing to use AWWRF for wet weather storage until expansion of SWWRF completed.*

- 07/14/2016: Committee of the Whole (includes City Council) met regarding AWWRF, Claude Tankersley and Steve Leavitt attending with Eric Peters, PE with Carollo. Peters presented on the AWWRF Start-up Evaluation.
- 08/30-9/3/16: Hurricane Hermine – AWWRF reactivated, discharging approx. 100mg into Tampa Bay. NWWRF bypass caused 58mg of partially treated effluent to discharge to Jungle Lake, thence to Boca Ciega Bay. Approximately 20 mgd of flow bypassed the SWWRF headworks.

09/03/2016: [Memo from Steve Leavitt to Sylvia Rosario and Kyle Soriano](#) authorizing them to unlock the surface water outfall at NW to test if it will remove partially treated wastewater.

09/16/2016: [Draft Consent Order OGC File No. 16-1280](#) is sent to the City.

10/04/2016: Interview with DEP and Craven Askew

10/16/2016: Interview with DEP, Sylvia Rosario and Janet DeBiasio

10/17/2016 Interview with Kyle Soriano

10/20/2016: Interview with DEP and Ken Wise. Claude Tankersley participated in final quarter of the discussion.

10/28/2016: Interview with DEP and Charlie Wise

10/28/2016 Interview with DEP and Steve Marshall

10/28/2016 Interview with DEP and Janet DeBiasio

11/03/2016 Mayor Rick Kriseman unveiled his [Wastewater Improvement Plan](#)

11/10/16 Interview with DEP and Tom Gibson

11/14/16 Interview with DEP and Evelyn Rosetti

## Appendix II: Total Daily Flows for All Facility

<u>AW</u> <u>Well</u>	(From MOR file , Totalizer page)						2016			
	Influent	RWS	UIC	Influent	RWS	UIC	Influent	RWS	UIC	
	<u>NE Plant</u>	<u>NE Rec</u>	<u>NE Well</u>	<u>NW Plant</u>	<u>NW Rec</u>	<u>NW Well</u>	<u>SW Plant</u>	<u>SW Rec</u>	<u>SW Well</u>	
0.00	9.77	3.21	6.70	10.67	9.54	1.52	21.94	7.83	17.39	
0.00	9.03	4.27	4.41	10.29	8.75	1.82	20.76	8.02	16.52	
0.00	8.73	6.13	1.52	10.17	6.57	1.95	20.13	11.38	12.35	
4.59	10.00	4.72	5.31	18.14	11.40	5.28	22.93	6.78	21.03	
0.00	9.93	3.70	7.28	16.78	9.69	7.16	23.49	5.97	19.36	
7.54	9.43	5.95	4.62	15.36	8.97	6.58	22.43	8.99	15.49	
5.56	10.50	4.52	4.70	16.78	9.04	6.11	23.97	7.35	18.94	
11.32	17.15	6.23	10.87	21.82	10.02	10.61	39.89	9.43	19.21	
16.59	18.27	9.36	7.61	26.70	13.43	10.51	41.26	4.68	36.53	
14.76	16.12	9.72	5.25	24.09	16.13	5.98	52.13	0.00	43.51	
13.73	13.26	9.20	4.75	19.17	16.11	0.00	42.35	0.00	42.19	
15.78	12.67	11.04	1.18	19.06	12.95	3.61	34.80	3.34	33.02	
16.75	11.45	10.01	0.64	17.86	8.06	5.74	30.97	10.89	21.91	
17.70	11.02	9.32	1.74	15.98	10.42	7.86	29.17	10.90	22.40	
14.74	10.44	8.38	0.02	14.13	9.65	3.82	27.97	11.34	21.89	
9.30	9.88	5.87	3.98	13.94	10.15	1.67	26.98	10.36	22.28	
6.20	9.68	5.52	3.19	13.60	9.07	3.49	26.61	10.70	21.28	
4.60	9.40	5.53	3.41	13.43	8.87	3.10	24.94	10.43	19.07	
4.53	9.54	5.55	2.95	13.25	10.27	1.58	24.94	10.78	19.17	
4.58	11.32	4.27	5.84	12.88	10.84	0.00	24.37	8.59	19.82	
1.45	10.69	3.78	5.89	12.30	9.84	1.86	23.08	7.26	19.01	
0.00	10.40	4.18	4.32	11.34	9.18	1.95	22.55	9.14	18.37	
0.00	10.22	3.98	5.83	10.91	8.33	1.67	23.36	10.07	17.50	
0.00	10.29	3.98	5.96	10.72	6.83	2.76	24.92	10.73	17.56	
0.00	9.67	3.32	6.57	10.63	6.84	5.02	23.48	10.34	16.52	
0.16	9.30	3.97	4.95	10.57	9.64	0.21	22.60	8.38	19.38	
0.00	10.23	2.87	8.24	12.34	8.66	3.00	25.28	5.88	22.31	
6.64	11.81	3.76	6.95	13.68	9.92	4.11	26.17	8.62	20.65	
12.76	12.04	7.47	2.77	12.67	9.32	3.16	25.53	11.97	16.75	
12.83	11.23	7.51	7.85	12.43	9.62	3.52	25.96	10.24	18.77	
13.23	23.21	13.41	10.20	29.52	5.35	13.83	43.77	5.09	35.40	
4.60	22.37	11.68	4.25	40.93	0.00	25.04	51.80	0.00	44.87	
0.00	21.32	8.11	16.38	38.80	0.00	24.97	54.26	0.00	44.20	
0.00	19.79	9.42	10.59	37.01	0.00	27.38	42.79	0.00	44.53	
0.00	17.41	9.05	8.22	33.52	0.00	26.32	43.60	0.00	44.47	
0.00	16.09	9.81	6.33	29.69	0.00	25.90	40.09	0.00	44.42	
0.00	15.53	10.37	3.79	28.90	0.00	25.78	41.58	0.00	44.36	
0.00	13.90	11.18	3.05	24.46	0.00	24.95	39.27	0.00	44.29	
0.00	12.72	11.44	0.78	21.87	0.00	24.39	37.33	0.00	44.06	
0.00	11.99	7.68	1.92	20.47	7.94	10.59	41.20	0.00	42.38	
0.00	11.46	3.65	8.03	19.29	13.07	4.71	38.68	0.00	42.43	

0.00	11.15	4.13	6.82	18.28	12.88	4.71	38.00	0.00	39.19
0.00	10.56	5.13	5.09	17.12	12.92	3.61	34.60	0.00	35.80
0.00	10.21	5.62	3.91	16.69	12.50	2.94	32.81	0.69	30.36
0.00	10.34	6.45	3.30	16.03	11.77	3.27	32.72	1.58	35.30
0.00	9.84	3.82	5.98	15.59	11.10	3.84	31.24	6.48	26.84
0.00	9.44	5.62	3.30	15.34	10.11	3.89	28.99	6.06	28.04
0.00	9.32	4.33	5.25	15.70	10.00	4.39	28.38	5.91	25.95
0.00	9.63	4.20	4.62	15.10	10.18	4.10	27.50	5.64	25.21
0.00	9.83	4.43	4.97	14.24	9.30	4.03	27.00	8.15	18.62
0.00	9.42	4.44	3.61	13.64	8.64	4.57	26.05	8.08	20.07
0.00	9.18	4.71	4.75	13.40	9.48	3.26	25.78	8.16	19.53
0.00	9.39	3.98	6.22	13.07	9.26	2.89	25.91	7.98	20.61
0.00	9.97	3.93	5.94	12.55	9.69	1.99	24.85	7.62	22.03
0.10	9.88	3.96	3.71	12.82	10.01	2.75	23.86	6.20	20.76
0.03	9.14	4.29	5.52	11.94	8.53	2.11	23.19	6.23	19.88
0.00	9.22	5.28	4.09	12.09	7.19	4.83	22.92	9.01	16.10
0.00	9.92	3.42	5.94	11.76	7.71	3.02	22.68	9.01	17.62
0.00	9.30	4.95	4.06	11.65	7.65	3.36	22.47	9.05	16.03
0.01	9.09	3.87	5.39	11.62	7.97	3.12	22.48	7.13	19.28
0.00	8.76	4.63	2.93	12.09	8.67	3.63	23.76	7.90	19.56