



**MEETING MINUTES
CITY OF FORT LAUDERDALE
INFRASTRUCTURE TASK FORCE ADVISORY COMMITTEE
VIRTUAL MEETING**

CITY OF FORT LAUDERDALE MONDAY, DECEMBER 7, 2020 – 2:00 P.M. TO 5:00 P.M.

February 2020-January 2021

Attendance

Marilyn Mammano, Chair	P	4	0
Gerald Angeli	P	4	0
Shane Grabski	A	3	1
Charlie Ladd (arr. 2:07)	P	3	1
Michael Marshall	A	3	1
Norm Ostrau	P	4	0
Peter Partington	P	4	0
Jacquelyn Scott	P	4	0
Roosevelt Walters	P	4	0
Ralph Zeltman	P	4	0

As of this date, there are 10 appointed members to the Committee, which means 6 would constitute a quorum.

Staff

- Aneisha Daniel, Deputy Director of Public Works
- Dr. Nancy Gassman, Assistant Director of Public Works – Sustainability
- Rick Johnson, Utilities Distribution and Collection Systems Manager
- Talal Abi-Karam, Assistant Director of Public Works – Utilities
- Victor Carosi, Assistant Director of Public Works -- Engineering
- Omar Castellon, Chief Engineer
- Jill Prizlee, Chief Engineer
- Steve Hillberg, Project Manager II
- Pauline Ricketts, Senior Administrative Assistant
- Igor Vassiliev, Project Manager II
- Melissa Doyle, Solid Waste and Recycling Program Manager
- Justin Murray, Regional Wastewater Facilities Manager
- Kymerly Holcombe, Business Operations Manager
- Crysta Parkinson, Recording Secretary, ProtoType, Inc.

Communication to the City Commission

None.

1. Call to Order

i. Roll Call

Chair Mammano called the meeting to order at 2:00 p.m.

Roll was called and it was noted a quorum was present.

ii. Approval of Agenda

Motion made by Mr. Walters, seconded by Mr. Partington, to approve. [The agenda was approved by consent.]

iii. Approval of Previous Meeting Minutes – October 19, 2020

Motion made by Ms. Scott, seconded by Mr. Partington, to approve with modifications.

The following corrections to the October 19, 2020 minutes were noted:

- P.6, paragraph 1: last sentence refers to the Lohmeyer plant rather than Fiveash
- P.6, paragraph 2: change “City” to “state” and “projects” to “requirements” in the first sentence
- P.7, paragraph 5: change “insurance services” to “Insurance Services Office”

The minutes were approved by consent.

2. General Discussion and Comments by Committee Members

Ms. Ricketts advised that the Committee may continue to meet virtually or in the City Commission chambers in the future. The Committee agreed by consensus to continue meeting using information technology.

Deputy Director of Public Works Aneisha Daniel introduced Victor Carosi, the City’s new Assistant Director of Public Works (Engineering).

Mr. Walters recalled that at the previous meeting, he had requested clarification of the terms “temporary” and “short-term” as used by the Assistant City Attorney. He advised that the terms are used interchangeably at times when moratoriums are discussed, which may be an issue. He recommended that the Committee choose one of the two terms to use consistently in the future when referring to moratoriums. Chair Mammano concluded that once the Committee’s data collection is complete and a moratorium is discussed further, they may wish to have an Assistant City Attorney more clearly define the appropriate term to refer to its time frame.

3. Old Business

i. Capacity Letter Process – Database and Cumulative Impact

Project Engineer Igor Vassiliev showed a presentation on the capacity letter process, including what is done to determine whether or not there is sufficient water, fire, and

sewer capacity for new development. The process begins when a potential development goes before the City's Development Review Committee (DRC): there must be proof that enough water for fire protection, wastewater, and potable water demand can be provided for the proposed project.

The Department of Sustainable Development (DSD) performs the analysis to determine whether or not the existing water/wastewater infrastructure can accommodate the needs of the proposed development. This is done using the Equivalent Residential Connection (ERC) calculation for water demand. One ERC equals 300 average gallons per day for water demand and 175 average gallons per day for sewer demand.

Mr. Vassiliev continued that the process also gives credits for existing uses on the proposed site: for example, if a developer proposes a new hotel or condominium on a site currently occupied by a number of single-family homes, the City would give credit for the use generated by those homes and subtract it from the proposed total increase. Categories of usage include single-family, mobile homes, condominiums, hotels, schools, and other developments.

The capacity process considers the full network from the water treatment plant through transmission and distribution networks to ensure there is sufficient infrastructure capacity to handle the proposed demand. The infrastructure considered includes water mains, gravity sewer mains, wastewater pump stations, and force mains. The condition of this infrastructure is also taken into consideration.

Mr. Vassiliev stated that once a capacity letter has been issued for a project, that project becomes part of the area's committed demand: even if the project has not yet been constructed, the City has committed to meet its needs. If the water/wastewater infrastructure lacks sufficient capacity to meet demand, the City considers making improvements. He offered the example of a large project planned in an area that is served with only a small gravity sewer: the developer may be asked to replace the existing infrastructure with larger pipes. Similarly, if a pump station cannot handle increased flow, upgrades to the station are recommended.

Mr. Vassiliev provided examples of letters that recommend the installation of upgrades by developers, including replacement of several hundred feet of gravity pipe and upsizing existing water mains and sewer lines. He concluded that all capacity letters include a summary of recommendations for specific developments.

Mr. Zeltman noted that in addition to regular consumption, fire flow requirements are also taken into consideration when a water main is sized. Mr. Vassiliev confirmed that this is included in the evaluation process, pointing out that fire flow requirements are among the most stringent requirements of water mains.

Chair Mammano asked if the table used in capacity analysis, which lists the average number of gallons of water and wastewater used and produced by a type of

development, was up to date. Mr. Vassiliev replied that he would find out when the table was last updated. He noted that the figures included in the table correspond to the numbers used by Broward County and are similar to other tables used throughout the industry to calculate demand.

Chair Mammano recalled the asset management report presented at the October Committee meeting, which provided ratings of the conditions of various pieces of infrastructure. She asked how Staff's review of the condition of pipes during capacity analysis is related to this report. Ms. Daniel clarified that capacity analysis and asset management are not related: the capacity process takes development into account, while asset management uses a condition assessment test to determine the likelihood of failure and scores and evaluates infrastructure accordingly.

Chair Mammano asked what might happen if there is sufficient capacity for new development, but the infrastructure in its subject area has been determined to be likely to fail. Ms. Daniel explained that the condition of aging infrastructure is a separate issue.

Mr. Partington asserted that this is what the City Commission has tasked the Committee with examining: the extent to which the condition of the City's infrastructure must be taken into account when evaluating adequacy. The analysis conducted for new development is almost exclusively based on capacity. He pointed out that older developments may have sufficient capacity for their use, but the pipes serving that development may have deteriorated to a point where they are no longer adequate to that use.

Mr. Ladd noted that fire hydrant tests are typically done adjacent to a project to verify that they have appropriate flow and pressure. Mr. Zeltman confirmed that fire flow testing is performed periodically, and recalled that he had asked to see the most recent information on this testing from the Fire Marshal's Office. He recalled that the Reiss report, which was prepared in 2015, showed a number of areas of concern where the City's water pressure may not meet current fire flow requirements. He emphasized that corrosion plays a role in reducing the ability to meet these requirements.

Mr. Zeltman continued that the City's sanitary sewer system was installed at a slope in order to maintain a velocity between 2 and 10 ft. per second. Over the years, the clay pipe in this system began to break up under South Florida's conditions, which affected the flow of material and allowed groundwater and sand to intrude into the pipes. The City is now lining its older pipes where possible as well as replacing broken pipes. This restores the system to the flows it was originally designed to accommodate.

Chair Mammano explained that her concern was that capacity letters are only good for a certain period of time, after which a developer must apply again if they have not already begun the project. Chief Engineer Omar Castellon stated that once a capacity letter has been issued, it is good for one year. Mr. Vassiliev further clarified that the developer has 18 months to go through the full DRC process; if they miss this deadline,

the entire process must re-start and the project's capacity is no longer considered to be reserved. Projects are tracked on a spreadsheet to determine whether or not their capacity remains committed.

Mr. Ladd advised that many projects that go through DRC review are either never built or significantly delayed. If a project's capacity letter has expired and the developer wishes to build the project, they must go through the capacity process once again in order to receive a permit for sewer and water use. When the developer applies for a building permit, the City requires evidence of DRC approval; if that approval is more than one year old, the developer is asked to provide an updated capacity letter. It is also possible that expired capacity may be reassigned to a different project and there is no remaining capacity for the delayed project.

Mr. Walters asked if re-lining a pipe significantly reduces its capacity, and if this is taken into consideration when a capacity letter is issued. Mr. Castellon replied that a pipe will not be re-lined if this would decrease its capacity: it would more likely be replaced with a larger pipe. Mr. Vassiliev further clarified that the lining is very thin material and improves the condition of the pipe wall by providing a smoother surface for flow. For this reason, the capacity may be more likely to increase rather than decrease.

Mr. Carosi advised that while pipe diameter does not change significantly when lined, the friction component of flow through the pipe is affected. The smoother lining restores the pipe's hydraulic capacity to its original state by reducing this friction.

Mr. Ladd asked if water supply pipes are typically relined or replaced. Mr. Zeltman replied that water mains are relined rather than replaced. Most relining is done in non-pressurized gravity pipes. In addition, replacing a small water main with a larger main can as much as quadruple the main's volume and capacity by doubling its size.

Mr. Partington asked if it is possible to standardize the presentation of capacity letters, as he has seen variations in the numbers listed over the years. Chair Mammano requested that the Committee see a copy of the spreadsheet used to track current developments and the capacity committed to them. Mr. Vassiliev cautioned that this information will serve only as a snapshot, as it will change over time as more projects come online.

Ms. Scott stated that she felt it would be helpful to see letters referring to both capacity and condition within the same document. Ms. Daniel reiterated that while capacity letters do not refer to the condition of the infrastructure, it is taken into consideration when capacity is determined. Mr. Castellon added that Staff plans to eventually incorporate the work done on the consent order into review of a specific area for future development.

Chair Mammano asserted that when condition is included in the analysis required for capacity letters, the moratorium issue arises. Ms. Scott added that instead of a

moratorium, the result could be a system in which a developer could provide some of the funds necessary to improve the condition of the infrastructure.

Mr. Partington pointed out that there are currently impact fees associated with the addition of development. Ms. Daniel clarified, however, that the condition of infrastructure is not part of the calculation used to determine impact fees.

Mr. Ladd noted that the main trunk sewer line from Commercial Boulevard to the George T. Lohmeyer Wastewater Treatment Plant is under construction in multiple areas, and asked for a time frame in which this system, including major mains, will become fully operational once more. Patricia Carney, representing consultants Hazen and Sawyer, replied that this redundant line is estimated to become operational no later than summer 2021. She characterized this project as fast-moving. Ms. Daniel added that the redundant line is approximately 65% complete at present.

Ms. Daniel addressed the addition of a condition assessment element to the capacity determination process, stating that this was likely to require an Ordinance change. She pointed out that there is now data on the condition of the system which was not available prior to the assessment, which helps to more accurately determine the likelihood of failure. Ms. Scott noted that this is very important to the City's Planning and Zoning Board as well as the Committee.

Mr. Ladd asked which connecting components of this system are next in line to be addressed after this main line, and the timing for their completion. Ms. Carney replied that these include the following locations:

- NW 13 Street: design complete, construction expected to begin in approximately one month
- Two large connector projects that lead to the Coral Ridge pump station: these are in the planning stage and slated to be complete no later than 2025

Ms. Carney concluded that these are bond projects, as they are part of the original Consent Order. Mr. Castellon confirmed that these are planned projects for which funds are available, including some funds from the original bond. Ms. Daniel advised that Staff would look into this further and provide more information at the next meeting.

Mr. Ladd asked if it would be accurate to state there is more risk in the Coral Ridge area until the new main is installed. Ms. Carney replied that both likelihood and consequence of failure are considered when prioritizing which pipes must be addressed first. The trunk line to which Mr. Ladd had previously referred would have high consequence of failure, as lift stations and other lines would not be able to pump into it. She noted that once work on the trunk main is complete, all development centered along its corridor would be helped.

Ms. Scott requested that at the next meeting, she would like to hear more information on impact fees, including how amounts are determined and whether or not these fees

might be used to improve infrastructure. Chair Mammano reiterated that she would also like to see the spreadsheet used to track capacity letters and development, including the most recently added projects.

4. New Business

i. Comparison Analysis CMOM vs. Reiss Report (Hazen & Sawyer)

Ms. Carney of consultant Hazen and Sawyer showed a PowerPoint presentation comparing the findings of the Force Main Condition Assessment (FMCA) report, with those of the Comprehensive Utilities Strategic Master Plan (CUSMP) report, also commonly referred to as the Reiss report.

The Reiss report began in 2015 and was completed in 2017. Upon its completion, the City negotiated its Consent Order, which required that a force main condition assessment of the entire City be conducted. This assessment was completed in 2020.

The Reiss report considered only those force mains that send water from pump stations to the George T. Lohmeyer treatment facility. It was also limited to lines that were 24 in. in diameter or larger within a limited radius around the treatment plant. This came to approximately 30 miles of force mains. The FMCA report, which was a requirement of the Consent Order, looked at all lines throughout the City, which came to nearly 110 miles.

The two reports mostly agreed with one another in their assessment of which lines were the most important to address within these limited networks. Ms. Carney reiterated that risk is determined by the combined likelihood and consequence of failure. She noted that 85% of the lines in the CUSMP report were determined to carry medium risk, with approximately three miles determined to be high risk and one mile at low risk. The FMCA report identified a very low amount of low-risk infrastructure, with the majority again determined to be medium and roughly 13 miles determined to be high risk.

The two reports addressed different scopes of work, which account for many of the differences in their findings. The CUSMP report was limited to 30 miles within a specific area, while the FMCA report reviewed the entire system. The data used in the Reiss report relied on the City's geographic information system (GIS) mapping and Staff interviews as well as some site visits, using an uncalibrated hydraulic model. The FMCA report used updated City GIS data from three years later, as well as mapping that incorporated this data, along with additional Staff interviews and limited site visits. Hazen and Sawyer also calibrated the hydraulic model to provide more accurate data, and conducted additional field work, including soil measurements to determine the potential for corrosion.

Ms. Carney continued that the likelihood and consequence of failure were multiplied for a mathematical approach to the risk score. The scores provided in the Reiss report were

limited, considering factors including material, age, and 2035 maximum hourly flow. The FMCA report used a larger scale that considered age, operating pressure, break history, pipe profile, internal and external sources, and maintenance records.

While the Reiss report looked only at diameter and redundancy when determining consequence of failure, the FMCA report expanded this to consider diameter, reliability, proximity to wellfields, environmental compliance, and impact to residential and essential services. Finally, the consulting team engaged in peer review with Staff, discussing the scoring assigned to risk factors in the likelihood and consequence of failure to determine consensus on the most important aspects.

Mr. Partington recalled that the CUSMP report determined a price of \$1.2 billion to address infrastructure on which the bond structure was based. He asked how more infrastructure at high or medium risk would affect this original bottom line. Ms. Carney replied that she would need to review data in the CUSMP report to determine what portion of the \$1.2 billion was slated for force main rehabilitation. Mr. Partington stated that in 2017, the City Manager's memo had specified \$526 million for the City's water system and \$580 million for the wastewater system.

Mr. Zeltman requested additional information on risk factors for the Prospect Wellfield, noting that there has been discussion of locating a new water treatment plant at this location. Ms. Carney stated that there are few force mains near the wellfield.

Chair Mammano requested that Hazen and Sawyer provide the Committee with the matrix used to assess potential impacts so they could more clearly understand the assessment.

Mr. Walters asked for more information regarding ownership of infrastructure. Ms. Carney replied that in addition to City-owned mains, the City's system also includes mains owned by Broward County and the city of Wilton Manors. Fort Lauderdale is not required to address the needs of this infrastructure, and there is no interconnection between City- and County-owned mains. The team did not assess infrastructure belonging to other entities.

Mr. Ladd asked if increasing the flow in force mains resulted in additional risk. Ms. Carney stated that it is best to maintain a set maximum velocity through the pipe. If more flow is added, the pressure within pipes is increased, and pump stations may not be able to pump adequately at a higher pressure. If they pump at a slower rate than necessary, the gravity system can become backed up. The addition of flow may have little impact on some pipes and stations and significant impact on others.

Ms. Carney emphasized that in addition to the age and condition of pipes, pump stations are also part of the issues affecting the overall system. While analysis of pump stations was not included in the requirements of the Consent Order, the team has been

working on this as part of the Asset Management/Capacity Management, Operations, and Maintenance (AM-CMOM) report.

Chair Mammano recalled that the Reiss report had identified a number of pump stations at which the flow was determined to be too high. She asked when the Committee can expect to see information on the condition and replacement or upgrade of pump stations. Ms. Carney replied that the pump stations include rotating equipment, which means they have a shorter life expectancy than pipes or basins. A City program exists for the replacement of pump stations as needed.

Another factor is the priority pump stations listed in the Reiss report, which were part of the Consent Order and which are now complete ahead of schedule. A third element is the capacity of pump stations, which was analyzed as part of a capacity model. Not every pump station would need to be replaced for capacity, although some stations have issues related to their conditions. Ms. Daniel advised that the CIP includes roughly \$20 million in funding for the repair and rehabilitation of 29 of the City's 186 pump stations.

Mr. Partington suggested that Staff consider whether future developments may increase flow through high-risk force mains with a significant likelihood of failure when analyzing adequacy and/or capacity for each development. He recommended that this analysis include a report on the likelihood of failure of these high-risk mains.

ii. Owner's Representative Role (Project Manager)

Steve Hillberg, Project Manager II with the Public Works Department, showed a presentation on the role of the owner's representative with regard to replacement of the Fiveash Wastewater Treatment Plant. The City has completed addressing and consolidating comments from different Departments on the solicitation package and is now taking final comments from the City Manager's Office. He estimated that the bid package is likely to be advertised in January 2021. Staff will seat a panel to select the most qualified consultant. The number of applicants will affect the length of the selection process.

Chair Mammano explained that the Committee wished to know what the role of an owner's representative will be. Ms. Daniel advised that this will include a number of aspects the Committee has discussed, including design management and delivery, engineering, and technical assistance. Because the size and scope of this project are very large, the City is taking time to ensure they have heard all necessary input on the RFP.

Mr. Hillberg continued that the owner's representative will be considered an extension of City Staff. Because Staff does not have the expertise to design a water treatment plant in-house, they are seeking a representative from a party that is familiar with the many different ways the project can be delivered. The owner's representative will also review

the conclusions made in the Carollo report to ensure that these are what the City wants and needs. They will serve as an advocate for the City.

Mr. Hillberg noted that the owner's representative will help the City vet the design proposals brought forward, although the City will control all final decisions. Ms. Daniel characterized the role of owner's representative as a party that will help to protect the City's interests by overseeing the project.

Mr. Zeltman asked if a final decision has been made regarding whether to build a new treatment plant on the existing Fiveash property or at another location such as the Prospect Wellfield. Mr. Castellon replied that at present, the wellfield seems to be the best option. The Fiveash facility would continue to be used for storage and distribution.

Mr. Partington requested more information on how the City Commission reached a decision on where to build the new plant. Mr. Castellon advised that construction of a new plant on the Fiveash site would have required demolition of the existing plant, which cannot be done until another facility is online to perform its work.

Chair Mammano asked for additional information on the role of the owner's representative in confirming the findings of the Carollo report, including the technology that report had proposed in addition to the prospective location of a new plant. Mr. Hillberg replied that the full scope of the owner's representative has not yet been determined in this much detail; however, he expected that the owner's representative would review and consider the conclusions reached by the Carollo report.

Mr. Walters asked if the owner's representative would assume or share any liability in the event that mistakes are made in the planning and implementation processes. Mr. Hillberg assured the Committee that the owner's representative is required to have errors of omission insurance to cover any mistakes and/or resulting damages.

Mr. Zeltman recalled that a pilot study on new technology that could be used in a new water treatment plant was discussed in the Carollo report, but was never completed. He felt that an investment of the size necessary to construct a new water treatment plant should conduct an extensive pilot study of new technology before the City makes an investment. Mr. Hillberg recalled that Carollo had reviewed projections related to new technology and determined that it would be too expensive to implement. Mr. Castellon stated that a new oxidation pre-treatment is recommended for consideration instead of the pilot study referred to by Carollo.

5. Public Works Update

i. Water & Sewer Breaks Report 2020

Ms. Daniel advised that after Staff submitted this report, an error was identified in one of its spreadsheets. Revised water and wastewater spreadsheets will be submitted in the future.

Utilities Distribution and Collection Systems Manager Rick Johnson reported that eight water main breaks occurred in October and 11 in November. There has been one break thus far in December. Contributing causes included age, corrosion, contractor error, and others.

Chair Mammano stated that she had hoped the Committee would see a more comprehensive breakdown reflecting gallons lost, the cost of repairs, and where breaks occurred throughout the City. Mr. Johnson further clarified that these breaks were in mains with a diameter of 4 in. or higher, and occurred randomly throughout the City rather than being concentrated in a particular area. The exception was a number of breaks located near the SE 17 Street ramp, which happened when a contractor exposed an unsupported pipe.

Chair Mammano commented that while the Committee has seen detailed information on the City's sewer system, less detail is available in relation to the water system. Ms. Daniel confirmed that this is the case, noting that Public Works Director Raj Verma hopes to focus more CIP dollars on the water system in the future.

Ms. Daniel suggested that in the future, Staff will also report whether or not a precautionary boil water notice was necessary as a result of breaks. Chair Mammano agreed that this would be particularly helpful to the general public. Mr. Angeli requested clarification of whether breaks occurred in parts of the City where a high risk of failure was determined to exist. Ms. Daniel cautioned that condition assessment information has not been collected as comprehensively for the water system as for the sewer system.

Mr. Johnson explained that the City is still in the process of mapping its assets within the water system: while they know where most infrastructure lies, they do not yet have a comprehensive map. A consultant will be brought in to map these assets and capture additional data that is not reflected in current GIS.

Ms. Daniel also provided information on sewer breaks, noting that no breaks occurred from April to July 2020; however, three breaks occurred in August, two in September, and one each in October and November. These are breaks in mains 6 in. or more in diameter. The report does not reflect information regarding sanitary sewer overflows (SSOs).

Talal Abi-Karam, Assistant Director of Public Works (Utilities), advised that Staff has compiled specific data related to the storms that occurred in October and November 2020. There were 16 incidents reported to the Florida Department of Environmental Protection (DEP), including SSOs. Most of these incidents were "bubbling manholes,"

which occur when the sewer system is full and there is nowhere for surface and/or king tide water to go.

Mr. Partington observed that while most of the incidents to which Mr. Abi-Karam had referred were due to rainfall, force main breaks continue to occur, which are significant because they involve sewage under pressure.

Chair Mammano noted that the public may sign up to receive notification of pollution incidents in Broward County, including the number of gallons spilled and whether specific waterways were affected. Mr. Abi-Karam confirmed that this data is tracked on a spreadsheet which can be provided to the Committee. He estimated that the City's conveyance and pressure systems, as well as the Lohmeyer plant, performed reasonably well during the last storm with no major breaks.

Mr. Partington requested more information on how the Lohmeyer plant operated during Tropical Storm Eta. He asked if any raw sewage backed up near this plant, or if treated gray water was released into the Intracoastal Waterway due to insufficiency of the plant's injection wells. Mr. Abi-Karam explained that the amount of flow coming into the Lohmeyer plant increased from an average of 45 to 47 million gallons per day (MGD) to over 92 MGD. The plant continued to treat water, but the water could not be injected into the wells, as it exceeded their capacity. As a result, water that was too much for well capacity was discharged into the Intracoastal Waterway. He emphasized that this water was treated and chlorinated prior to discharge.

Mr. Abi-Karam continued that there was no surface discharge at the Lohmeyer plant or at influent pump stations. The capacity of each individual injection well is capped at approximately 18.6 MGD. The water discharged into the Intracoastal Waterway was reported to DEP as an abnormal event. He concluded that in October and November 2020, Broward County received 30% to 40% of its expected rainfall for the entire year. These conditions occurred in several municipalities throughout the County.

Chair Mammano noted that the capacity letters issued for developments also take the capacity of the City's water treatment plants into consideration. She asked if the plant's capacity to inject water into wells is capped. Mr. Abi-Karam replied that the plant's capacity is determined on multiple levels, including the capacity of volume allowed in tankage, capacity for treatment of water, and capacity for water that can be injected into wells.

When a municipality's water treatment plants approach the "red zone," letters will be issued to those facilities urging them to plan for capacity expansion. Chair Mammano observed that the City's capacity letters assume an average plant capacity of 48 MGD and a three-month average of 56.6 MGD, even though it may be possible for the plant to accommodate greater capacity. A plant's capacity cannot change, however, without the addition of structures to accommodate greater volume.

ii. Rainfall Flooding & System Impact Report

Dr. Nancy Gassman, Assistant Director of Public Works (Sustainability), showed a PowerPoint presentation on the unprecedented flooding experienced by the City over the last 40 days. She advised that it has always been known that significant rainfall accompanying a tropical storm event would result in flooding. Most of the City's stormwater system is a gravity-based system. The tropical storms resulted in substantial groundwater table elevation and saturation.

Dr. Gassman confirmed that significant rainfall events are becoming more frequent as a result of climate change. Fall 2020 included both significant tidal events associated with both mild storms and storm surge, and more extreme rainfall is increasing in frequency as well. This has created challenges for Fort Lauderdale's existing stormwater infrastructure, as well as other infrastructure affected by the elevated groundwater table.

Between October 1 and the second week of November 2020, the City recorded 32 in. of rainfall at the Lohmeyer facility, which represents 60% of the annual rainfall received in 40 days. The City also received nearly 30% of its annual rainfall in May 2020. At the beginning of October, the groundwater level was approximately 4 ft. below the surface; following rain events from October 19-22, another 8.2 in. of rainfall was received, which raised the groundwater table to allow only 2 ft. of clearance.

When another 6.3 in. of rain occurred on October 25, this raised the groundwater table to near its saturation point. This was followed by Tropical Storm Eta, which deposited 9 to 10.5 in. of rain on the City, completely saturating the groundwater table and resulting in overland flow of stormwater.

Another issue was king tides, which occurred within the same time frame as October rainfall events. The king tide was substantially over the threshold that would inundate low-lying streets with tidal flow, due in part to the storm surge that accompanied Tropical Storm Eta. This surge further aggravated some of the challenges associated with flooding in the eastern part of the City.

Dr. Gassman explained that the City's stormwater system capacity was designed to accommodate 3 in. of rainfall in a 24-hour period, which was substantially exceeded multiple times in October and November 2020. She emphasized that when ponding does not clear from a roadway within hours of an event, this does not mean there is an issue with the stormwater management system: however, if ponding persists for more than three days after a storm, the City should consider changes to its stormwater system, including the potential for capital improvements. Most neighborhoods did not exceed this criterion even after the October 25 rain event or after Tropical Storm Eta. The expectations of residents are not always aligned with the design of the system.

Most calls to the City's customer service center after these events came from the Melrose Park/Melrose Manors neighborhoods; however, a significant number of calls

were placed even in Commission Districts 2 and 4. There were 329 calls from the Melrose Park area in District 3 and over 100 calls from Melrose Manors. The most severely affected neighborhoods experienced flooding of roadways as well as some flooding within homes. Dr. Gassman noted that most of these homes did not meet the general flooding criteria, as the water receded within a 24-hour period. The neighborhoods that experienced flooding are scheduled to receive improvements either as part of the current Stormwater Master Plan or are expected to see comprehensive improvements in the next phase of that Plan.

Mr. Partington commented that he felt a number of stormwater projects have been designed and funded as a result of the work done by the Committee. He continued that the City should give greater consideration to its existing drainage design standards, as major rain events are expected to continue with increasing frequency and the basis on which these standards were developed has shifted.

Dr. Gassman advised that when the most recent Stormwater Master Plan was completed in 2018, it included a projection of change in rainfall as well as in sea level rise predictions as part of the modeling activity. The intent was to meet a 10-year flood level of service (LOS) for affected neighborhoods which would be consistent with future conditions of more rainfall and higher sea level.

Chair Mammano asked if there has been any consideration of changing design criteria to meet residents' expectations. She cited the clearance of water from the roadways in 72 hours as an example, recalling that Dr. Gassman had noted residents expect faster clearance. Dr. Gassman replied that the design criteria address a certain amount of flooding over the crown of a road to a specific depth of water, while flooding criteria are an internal standard used to determine whether a major change must be made to existing infrastructure. If a neighborhood experiences a storm within the parameters of the system's design, there should be substantial reduction of the intensity, duration, and frequency of flooding in those locations; however, if a neighborhood experiences a storm beyond those design standards, the system is not capable of managing these levels of rainfall and expectations of clearance may not be realistic.

Motion made by Mr. Partington, seconded by Mr. Walters, to extend [the meeting]. In a voice vote, the **motion** passed unanimously.

Paul Chettle, member of the public, stated that he fully endorsed "the progression of the water and sewer capacity letter," noting that a number of projects approved by the Planning and Zoning Board and the City Commission seem to directly contradict the findings of consultant Hazen and Sawyer regarding water and sewer capacity.

Mr. Chettle also addressed stormwater, pointing out that while Tropical Storm Eta was considered an anomaly, these events are becoming more regular in recent years, and the system has discharged treated water into City waterways. He expressed concern with the discharge of this water, and noted that a high level of bacteria was found in the

water at three separate testing sites in the month of November. He asked if these readings were higher or lower than anticipated.

Mr. Chettle also asked how many gallons of water taken into the Lohmeyer plant and injected into wells are categorized as “fully treated effluent.” He recalled that when several million gallons of treated water were discharged into the Intracoastal Waterway following a rain event in 2018, the City issued a precautionary advisory, but did not believe an advisory was issued after recent rain events. He concluded that he would like the term “gray water” explained in layman’s terms.

Mr. Abi-Karam advised that “gray water” is defined as treated water, which is typically placed in a deep injection well after it has been treated at a facility. He reiterated that following the rain events described earlier, the capacity of the wellfield was exceeded, resulting in the discharge of treated water into the Intracoastal Waterway. This was reported to DEP according to their guidelines.

Mr. Abi-Karam continued that similar events occurred following Hurricane Irma, as well as when power was lost at the Lohmeyer treatment plant. In these cases, treated water was also discharged into the waterway and reported to DEP as necessary. Testing was done following this discharge and the results were reported to DEP.

Dr. Gassman advised that any sample taken from City waterways after Tropical Storm Eta was likely to show a higher level of bacteria. When fully treated water is discharged into the Intracoastal Waterway, it has gone through a treatment process with the intent of being discharged into an injection well. While it is not considered potable water, it has been treated for bacterial components of wastewater and approved for discharge into injection wells.

After major storm events, sampling is done to determine whether or not there is an excessive amount of bacteria discharged into water. If the treatment process is effective, high levels of bacteria from this discharge are not expected. Dr. Gassman clarified that while releasing treated water into the waterway is not a regular practice, it is used to deal with emergency situations. The test results to which Mr. Chettle had referred were not considered unusual shortly after a 9 in. rain event.

Ms. Scott asked if there is a need for precautionary signage regarding public use of waterways due to the release of treated water. Dr. Gassman reiterated that treated water is not considered in the same way as a sanitary sewer overflow. She did not recall that any signage was posted after the recent release of treated water. Ms. Scott characterized this as a mistake.

Chair Mammano pointed out that the Intracoastal Waterway remains relatively polluted, and asked how the samplings after effluent discharge compared to baseline findings. Dr. Gassman replied that bacterial concentrations in the range of hundreds are normal within an urban waterway after any type of rainfall event. After an SSO, when untreated

wastewater may run into waterways, it is not uncommon to see these concentrations in the thousands or tens of thousands. The levels taken after recent rain events showed concentrations in the hundreds, which may not have differed from a baseline sample after a significant rainfall event.

Dr. Gassman emphasized that these levels of bacteria are not uncommon within any waterway within Broward County where stormwater discharges occur. When the results of bacteria sampling are published, it is typical to see levels in the hundreds on a regular basis.

Ms. Scott again stated that precautionary signage should be used whenever gray water is released into the canal, advising the public not to swim or otherwise use the waterway for a period of time. Chair Mammano proposed that the Committee should place discussion of water quality on a future agenda.

6. Information

i. Water & Sewer Bond Expenditure Report

This Item was not addressed.

ii. Fire Hydrant Maintenance and Testing

This Item was not addressed.

7. Public Comments

None.

8. Adjournment – Next Regular Meeting TBA

There being no further business to come before the Committee at this time, the meeting was adjourned at 5:17 p.m.

Any written public comments made 48 hours prior to the meeting regarding items discussed during the proceedings have been attached hereto.

[Minutes prepared by K. McGuire, ProtoType, Inc.]