



AGENDA ITEM MEMORADUM

Item No. 2a

Municipal Service

Department

Don Prince

Department Director

COMMISSION MEETING DATE (*) - 7:00 PM	Deadline to Town Clerk
<input type="checkbox"/> Jan 10, 2012	Dec 30 th
<input checked="" type="checkbox"/> Jan 19, 2012 Workshop	Jan 6
<input type="checkbox"/> Jan 24, 2012	Jan 13
<input type="checkbox"/> Feb 14, 2012	Feb 3
<input type="checkbox"/> Feb 28, 2012	Feb 17

**Subject to Change*

- Presentation Reports Consent Ordinance
 Resolution Quasi-Judicial Old Business New Business

FY2012 DESIGNATED HIGH PRIORITY ITEM - PRIORITY TOPIC: EVALUATION OF TOWN-OWNED SEWER SYSTEM

SUBJECT TITLE: King Engineering Sewer System Evaluation Presentation

EXPLANATION: On August 23, 2011, the Commission unanimously approved King Engineering to conduct an evaluation of the Town owned sanitary sewer system, recommend improvements, prepare cost estimates and develop a Sanitary Sewer Capital Improvements Plan. King's report is **Exhibit 1** to this agenda item.

King's contract called for them to review the videos produced by our contractor, Televac, of the sewer lines to determine needed repairs, to evaluate the extent to which the Town is experiencing infiltration and inflow (I&I), to evaluate the condition of our two lift stations, to test the flow meters to determine if they are accurate, and a number of other evaluative procedures and analyses.

Gravity Sewer Line Repair/Rehab

King has recommended repairing all the sewer mains that received a NASCO score of (5) five these are the lines that are in the worst shape and have the greatest amount of I&I. (Infiltration is when groundwater enters the sewer system through cracks and holes in the pipes. Inflow is direct runoff from illegal connection such as gutters or drains both forms of I&I are literally money down the drain.) A detailed explanation can be found on page 25 of the evaluation. King estimates the cost for these repairs – which are a combination of grouting, lining existing sewer pipes (which can be done without digging up the streets, and some point repairs (which involve digging up the roadways) is \$500,000 for construction and & 75,000 for inspection.

In Table 1 in this agenda item, we have shown King's recommended Capital Improvement Plan and Project Schedule (CIPPS). It calls for aggressive action in addressing the items that would reduce the greatest amount of I&I (infiltration & inflow). While we suggested King set an aggressive schedule, we are realizing that it is unlikely that all the repairs could get done in FY 2012 and recommend that any projects not completed be budgeted in FY 2013. We do agree that these should be done as quickly as possible so that we can reduce I&I, which will reduce the amount of flow we send to Pompano for treatment and, therefore, our costs.

As you know, Mathews Consulting is creating construction bid specifications that will allow the Town to proceed more quickly on infrastructure repairs. We have advised them to include the lining, point repairs, and other sewer system repairs (exclusive of grouting) in those specifications.



Lateral Lines Evaluation

In the past the Town has focused on cleaning, televising and repairing only the main lines and not the laterals leading to the properties. To the best of my knowledge the laterals have never been televised. King recommends that all the laterals be televised so that the Town will have a complete picture of the entire system. Without doing so, they cannot estimate whether the laterals need repair or replacement. We also sought their guidance on how often the Town should be televising the sewer lines and they recommended that we do it less frequently than we currently do; instead of doing the entire Town system over a two year period, they suggest a three year period.

As a result, last month Tele Vac was instructed to start this process starting at the south end of Town and working North using the funds already in the FY2012 sewer operating budget for televising the lines. To date Tele Vac has completed Coodrington and Imperial and will continue moving North in the residential areas before moving to the Business and Beach area. Tele Vac will also mark the sewer clean outs that should be at the edge of the right of way at every property but have been covered over time by grass, asphalt or driveways. King's estimated total cost to televise, mark the clean outs and make repairs was \$94,900. King also estimated that it will cost \$12,800 to review the data from televising the laterals. **Once the laterals are televised and reviewed it is almost certain there will be additional repairs required.**

We budgeted \$80,000 total in the FY12 budget for televising and had spent \$25,000 early in the fiscal year on sewer line repairs; that leaves \$55,000 to do the lateral televising. We will need the Commission to appropriate the additional funds (\$53,000) from the Sewer Fund Balance to complete televising the laterals and evaluate the results.

Town Staff will follow behind Tele Vac inspecting each clean out making repairs where possible and placing a valve box over top of the clean out. This will provide the homeowner with an easy access point to their sewer system in the event they have a blockage. This will also give Town Staff an invaluable tool in determining where the blockages are when residents call and say they have a blockage and don't know if it's their blockage or the Town's. Town Staff would be able to access the clean out at the right of way and make a determination immediately. It should be noted that some clean outs may not be able to be uncovered as some have already been found under expensive paver or concrete driveways. Town Staff will notify the property owner and mark the sewer map where the clean out should be located.

Other Repairs

King has recommended minor repairs to the pump stations and generator that could be completed in FY2012 with monies already budgeted in the pump station maintenance account.

Sewer System Capacity Evaluation

All of the respondents to our scope of services for the sewer system evaluation recommended that the Town have a Sewer System Capacity Evaluation done as part of this study. King advises this is standard practice in all sewer CIPs. Such an evaluation projects the potential growth of the Town and the demand that could place on the sewer system to determine if larger lines are needed. Because of the cost of such an evaluation (\$50,000) and the fact that Town's 3 story height limitation limits how much development can take place; Town staff did not recommend that study. There is available capacity in the system currently and King will speak to that at Thursday evening's meeting. Whether that capacity is sufficient to absorb the sewer flows if the Town developed to maximum build out under the Charter restrictions, we don't know. That is what this analysis would tell us.



Project	Projections										Total per Project	
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021		
Generator Load Bank Test												
8 Seagrape LS # 24 (10) - Generator Replacement											\$52,000.00	\$52,000.00
9 Install New Manhole Cover Insert (Completed on January 2012)												\$ -
10 Gravity Sewer System Capacity Evaluation (Model)	\$50,000.00											\$50,000.00
11 Suspect Lateral I/I Program (to be performed every 10 years)												

11.1	Cleanout Installation	\$94,900.00										\$94,900.00
11.2	Data Evaluation and Repair Recommendation	\$12,800.00										\$12,800.00
11.3	Lateral Rehabilitation		TBD									TBD
11.4	Engineering / CM / Inspection for item 11.3		TBD									TBD
11.5	Smoke Testing			\$30,600.00								\$30,600.00
11.6	CM / Inspection for item 11.5			\$6,100.00								\$6,100.00
12	I/I Reduction Maintenance Program											
12.1	Data Evaluation / Repair Recommendation				\$13,600.00			\$14,900.00			\$16,200.00	\$44,700.00
12.2	Mainline Rehabilitation					TBD			TBD			TBD
12.3	Engineering / CM / Inspection for item 12.2					TBD			TBD			TBD
Total per Year		\$736,400.00	\$354,400.00	\$55,000.00	\$13,600.00	TBD	\$ -	\$14,900.00	TBD	\$ -	\$1,134,900.00	Total
												\$2,309,200.00

Financial Impact

In the current budget, we budgeted \$200,000 for capital repairs for starters, pending receipt of this system evaluation. At the end of FY 2011, we had approximately \$1.6 million in the undesignated Sewer Fund balance, so there are sufficient funds to complete the repairs recommended by King.



EXHIBIT(S):

Exhibit 1: Sanitary Sewer System Evaluation Report from King Engineering Associates Inc.

Reviewed by Town Attorney

Yes No

Town Manager Initials CA

Town of Lauderdale-By-The-Sea

Project No. 11-04-02

Work Order # 1

Sanitary Sewer Capital Improvements Plan

January 11, 2012



Town of Lauderdale-By-The-Sea
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ACKNOWLEDGMENTS

The work completed as part of this project reflects the joint team effort of the Town of Lauderdale-By-The-Sea (LBTS) staff, the City of Pompano Beach (Pompano) staff, and the members of the King Engineering Associates, Inc. (King).

The cooperation and professionalism demonstrated by LBTS and Pompano staff was key to the successful completion of this project. We gratefully acknowledge the special contributions of the following LBTS and Pompano team members:

Roseann Minnet	-	Mayor, Town of Lauderdale-by-the-Sea
Stuart Dodd	-	Vice Mayor, Town of Lauderdale-by-the-Sea
Birute Ann Clottery	-	Commissioner, Town of Lauderdale-by-the-Sea
Scot Sasser	-	Commissioner, Town of Lauderdale-by-the-Sea
Christopher Vincent	-	Commissioner, Town of Lauderdale-by-the-Sea
Connie Hoffman	-	Town Manager, Town of Lauderdale-by-the-Sea
Don Prince	-	Municipal Services Director, Town of Lauderdale-by-the-Sea
Pat Himelberger	-	Assistant to the Town Manager, Town of Lauderdale-by-the-Sea
Tony Bryan	-	Finance Director, Town of Lauderdale-by-the-Sea
Steve Almyda	-	Wastewater Collection Supervisor, City of Pompano
Bobby Clayton	-	Wastewater Pumping Supervisor, City of Pompano
Ernie Kearse	-	Maintenance Crew, City of Pompano
Dan Newell	-	Maintenance Crew, City of Pompano



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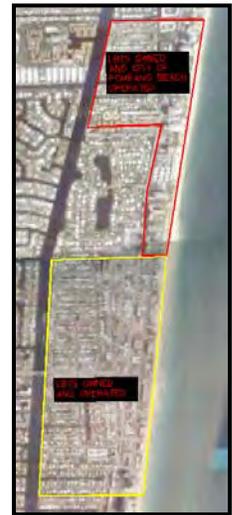
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EXECUTIVE SUMMARY

The Town of Lauderdale-by-the-Sea (LBTS) is evaluating the Town owned and maintained gravity sewer system encompassing the Seagrape and Hibiscus service areas from Flamingo Avenue to Pine Avenue and from the Intracoastal to the sea. The rest of the Town sewer system is operated by the City of Pompano Beach. A comprehensive Sanitary Sewer Capital Improvements Plan (SSCIP) was prepared to assist the Town in planning ongoing maintenance, system repairs and upgrades, and quantifying the potential savings from the implementation of an Infiltration and Inflow (I/I) program for the Town owned and maintained sewer area only. The SSCIP will give the Town the ability to prioritize recommended system repairs based on cost and return period, allowing for strategic cost-benefit implementation of all recommended repairs and upgrades.



LBTS operated system

The LBTS owned and maintained sanitary sewer collection system consists of two separate wastewater collection basins with approximately 10.5 miles of gravity pipes, 165 manholes, and two lift stations (LS-24 (10) and LS-25 (2)) with their respective force mains. The existing gravity sewer system, flow meter, and lift stations were evaluated as part of the SSCIP development process. Table 1 provides a summary of the results of this evaluation. Dry season peak hour flows correspond to the seasonal population and are therefore higher in spite of lower I/I rates during the dry season.

Table 1
Project Summary

Topic	Results
Video Review	<ul style="list-style-type: none"> 632 total defects 36% of line segments received a NASSCO score of 5 (most severe) 253 repair recommendations \$ 808,900 total projected repair cost (including 15% contingency) 136 gpm estimated I/I
Flow Meter Evaluation	<ul style="list-style-type: none"> Calibrated within 0.2% margin of error Installed as per manufacturer's specifications
Lift Station Evaluation	<p>Hibiscus – LS 25 (2):</p> <ul style="list-style-type: none"> Two (2) EBARA submersible non-clog pumps; model number 100 DLMF 65.5, 7.5 HP 6-inch discharge piping Nominal Average Pump Operating Time (NAPOT): 2.53 hours Pump down test: 396 gpm (Pumps 1 and 2) “Design” Peaking Factor: 3.9 2010 “design” peak hour flow: 214.5 gpm dry season*, 129 gpm wet season 2035 “design” peak hour flow: 289 gpm dry season*, 175.5 wet season <p>Seagrape – LS 24 (10):</p> <ul style="list-style-type: none"> Two (2) EBARA submersible non-clog pumps; model number 250DLFU645, 60 HP motors 10-inch discharge piping NAPOT: 6.78 hours Pump down test: 1010 gpm (Pump 1) and 808 gpm (Pump 2) “Design” Peaking Factor: 3.9 2010 “design” peak hour flow: 955.5 gpm dry season*, 579 gpm wet season 2035 “design” peak hour flow: 1,462.5 gpm dry season*, 885 wet season



Topic	Results
I/I Evaluation	<p>Hibiscus – LS 25 (2):</p> <ul style="list-style-type: none"> • 21 gpm groundwater infiltration (dry season night flows) • 30 gpm groundwater infiltration (wet season night flows) • 39 gpm Average Annual Daily Flow (AADF) • 261 gpm Peak Rain Dependant I/I (RDII) for 4.5 inches of rain • 278 gpm Peak Hour Flow for 4.5 inches of rain • 7.13 Peak Factor • 3,272 Gallons per Day per Inch-Mile (GDPIM)*** <p>Seagrape – LS 24 (10):</p> <ul style="list-style-type: none"> • 114 gpm groundwater infiltration (dry season night flows) • 241 gpm AADF – SCADA** • 364 gpm AADF – Flow Meter** • 1,441 gpm Peak Rain Dependant I/I (RDII) for 4.5 inches of rain • 1,594 gpm Peak Hour Flow for 4.5 inches of rain • 4.38 Peak Factor • 2,915 GDPIM** • Potential I/I savings between \$86,714 (40% I/I reduction) and \$216,785 (100% I/I reduction) per year. • Payback period between 7.38 years (40% I/I reduction) and 2.95 years (100% I/I reduction).
SSCIP (Future Costs Adjusted for 3% Annual Inflation)	<ul style="list-style-type: none"> • Gravity System Rehabilitation (\$ 930,400 over two years) • Hibiscus Lift Station – LS 25 (2) Minor Repairs (\$ 6,800) • Hibiscus Lift Station – LS 25 (2) Full Upgrade (\$ 268,000 in 2021) • Seagrape Lift Station – LS 24 (10) Minor Repairs (\$ 13,000) • Seagrape Lift Station – LS 24 (10) Full Upgrade (\$ 783,000 in 2021) • Flow Meter Replacement (\$ 15,700 in 2021) • Generator Load Bank Test (\$ 1,200) • Generator Replacement (\$ 52,000 in 2021) • 165 Manhole Seals (Completed on January 2012) • Gravity Sewer System Capacity Evaluation – Model (\$ 50,000) • Lift Station Monitoring Program (\$94,600 over ten years) • Suspect Lateral I/I Program (\$ 213,300) • I/I Reduction Maintenance Program (\$ 413,100 over ten years) • Identified Repair Recommendation (TBD) • Engineering/CM/Inspection (TBD)

* Dry season peak hour flows correspond to the seasonal “snow bird” population and are therefore higher in spite of lower I/I rates during the dry season.

**SCADA and Flow Meter AADF do not match because the SCADA flows, due to the methodology of calculation, exclude all peaks occurring during rain events (or any time the pump run time exceeds the pump off time)

***The Environmental Protection Agency (EPA) typically requires mainline repairs to be done once the gallons per day per inch-mile (GDPIM) exceed 5,000. However, it should be noted that EPA is currently considering lowering this standard to 1,000 GDPIM.



INTRODUCTION

LBTS has retained King to develop a Sanitary Sewer Capital Improvements Plan (SSCIP) including evaluations to quantify the needs of the Town's owned and maintained sanitary sewer system, improvement recommendations, cost estimates, and schedule. The LBTS owned and maintained sanitary sewer collection system consists of two separate wastewater collection basins with approximately 10.5 miles of gravity pipes, 165 manholes, and two lift stations (Seagrape LS-24 (10) and Hibiscus LS-25 (2)) with their respective force mains.

The work performed includes the review of 165 closed circuit TV (CCTV) recordings of the Town's gravity sewer system provided by TELEVAC; repair recommendations based on King's repair protocol approved by the Town for defective segments identified in the video review; existing flow meter evaluation; lift stations inspection and evaluation including hydraulic analysis, spacing requirements, and electrical requirements; existing backup generator evaluation; infiltration and inflow (I/I) evaluation through the development of dry and wet weather hydrographs for each lift station, and SSCIP Report.

The SSCIP summarizes the work performed and provides a prioritized master project schedule for implementation of all the identified improvement projects with its corresponding budgets.



LBTS Sewer Map

PROJECT LOCATION



Lauderdale-By-The-Sea Entrance

LBTS is located in Broward County and is bordered by the City of Fort Lauderdale to the South, the Intracoastal Waterway to the West, the City of Pompano Beach to the North and the Atlantic Ocean to the East. The Town has a population of 6,056 as of the 2010 US Census but reaches over 10,000 during the winter months. The study area is approximately 225 acres covering the service areas for the Town-owned Hibiscus and Seagrape lift stations. The Hibiscus lift station (LS # 25 (2)) is located at the Southeast corner of the intersection of Hibiscus Avenue and Allenwood Drive. The Seagrape lift station (LS # 24 (10)) is located on the West side of Seagrape Drive between Commercial Boulevard and Harbor Drive. See Project Location Map in Appendix A.



1 – VIDEO REVIEW AND R&R IDENTIFICATION

LBTS provided videos and CCTV inspection forms (TV logs) collected by TELEVAC for 165 gravity sewer main lines. King performed a follow up evaluation of the video records and forms and provided recommendations to rehabilitate the gravity sewer system and to perform future CCTV inspections.

Video Review

Each video was reviewed in its entirety to confirm that the conditions of the gravity sewer lines were documented and identified thoroughly and consistently in the CCTV inspection forms. Some gravity sewer main lines could not be evaluated in their entirety due to either heavy fog, because the depth of flow was too high, and/or the survey was stopped before reaching the upstream or downstream manhole.

King offers the following recommendations for the future collection of data during CCTV inspections of gravity sewer lines:

- Pan and tilt all sewer laterals (active and/or non-active). Document any visible sewer lateral defect.
- Stop and pan joints with active infiltration, sign of infiltration, and/or deposits.
- Depth of sewer flow should be at most $\frac{1}{4}$ of vertical pipe diameter. Use nozzle ahead of camera to reduce the depth of flow or use plugs as required or use by-pass pumping for heavy flows.
- Use blower in manhole to remove fog in line.
- Use only one video file per line segment.
- In presence of obstructions or equipment limitations, perform a reverse set up at the next manhole to fully view the entire line segment.

With respect to the condition of the sewer laterals, due to current budget constraints most of them were panned and tilted for less than 20 seconds which did not allow sufficient time to determine whether laterals without obvious physical defects were a source of I/I flow. Therefore, lateral I/I flow contributions were only determined for laterals with clear physical defects.

Combining I/I flows from the mainline and the limited I/I flows from the laterals, it was estimated that the Seagrape lift station (LS # 24 (10)) and Hibiscus lift station (LS # 25 (2)) contribute 125 gpm and 11.4 gpm, respectively, for a total I/I estimate of 136.4 gpm. These estimates are representative of field conditions at the time of the video, are missing potential I/I from suspect laterals, and do not include rainfall induced I/I.

For future CCTV inspections, King recommends the implementation of a typical “Lateral Inspection Protocol” to allow estimation of suspect lateral I/I flow, as follows:

- Wait at least 3 minutes.
- If the flow subsides or is murky, the flow is probably domestic.
- If the flow is clear and does not subside, check the water meter.
- If the meter is not running, the flow is I/I.
- If the meter is running, the flow is probably domestic.

The as-builts provided by LBTS contained 163 gravity sewer main lines. However, two more line segments (total of 165) were identified and inspected as per the data recorded by TELEVAC. These two lines belonged to the Seagrape service area (LS # 24 (10)) and were named as follows:

1. Upstream MH: Town Homes Downstream MH: 40A
2. Upstream MH: East Downstream MH: 40A

King renamed the above new line segments and prepared the Atlas Correction Form (2) as shown in Appendix B.



The video review analysis resulted in a total of 632 identified defects including mainline and laterals with defects observable from the videos. The list of defects found is summarized in Table 2 and is presented in greater detail, including a breakdown of defects by basin, in Appendix C.

Table 2
Defects Identified Via CCTV

Defect Definition	Count
Longitudinal Crack	195
Joint/Infiltration	144
Joint/Stains	101
Multiple Cracks	55
Circular Crack	46
Deposits	32
Light Roots	29
Medium Roots	16
Broken Pipe	7
Heavy Roots	3
Joint/Severe Offset	2
Heavy Sag in Pipe	1
Joint/Separated	1
Total	632

Review of the CCTV inspections indicated that the majority of the visible pipeline defects included different types of cracks and joint problems with active and non-active infiltration. The majority of the cracks were visibly open and a gap could be noticed although the sections of the pipe/sewer wall were still in place.

King used the National Association of Sewer Companies (NASSCO) PACP Quick Rating System to provide the number and severity of defects found and to prioritize the repairs. Each line segment was assigned with a four character score as follows:

Table 3
NASSCO – PACP Quick Rating System

1 st Character	2 nd Character	3 rd Character	4 th Character
The highest severity grade*	Total number of occurrences of the highest severity grade*	The next highest severity grade*	Total number of occurrences of the next highest severity grade*

*Grades range from 1 to 5, with 1 being the least severe defect and 5 the most severe defect. A line segment with no defect would have a score of 0000.

After identifying the type of defect, King followed the pre-established “Repair Criteria and Technology Guidelines”, in Appendix D, and provided repair recommendations.

The NASSCO PACP Quick Rating System was applied to every recommendation. The NASSCO Score results for the entire gravity sewer system are summarized in Table 4 and are presented in greater detail and ordered from highest to lowest significance of defects in Appendix E.



Table 4
NASSCO Score Results

Ranking (1 st Character)	Basin No.		Total per Ranking	Percent per Ranking
	Hibiscus Lift Station (LS # 25 (2))	Seagrape Lift Station (LS # 24 (10))		
5	6	52	58	35%
4	2	29	31	19%
3	8	21	29	18%
2	2	2	4	2%
1	0	9	9	5%
0	8	26	34	21%
Total	26	139	165	100%

In general, the score grading system indicated that 21% of the sewer lines appeared to be in good condition while 36% fell within the rating score with the most significant defects. In addition, a NASSCO Score map is included in Appendix F to show a general plan view of the conditions of each line segment.

As discussed, a two stage rehabilitation program is recommended as follows:

Table 5
Two Stage Rehabilitation Program

Ranking (1 st Character)	Year
5	1 st Year
4/3/2/1	2 nd Year

The proposed project repair schedule is included in Appendix G and further discussed in Section - 5 - SSCIP.

Repair Recommendations

All recommended repairs followed the approved "Repair Criteria and Technology Guidelines". In cases where the protocol led to a recommendation for point repairs (robotic, sectional liner, or excavated), a comparison was made between the cost of point repairs and full length repair (CIPP or line replacement). If cost of point repairs represented 80% or more of the cost of full length repair, then full length repair was recommended. In addition, please see the 'Planning Level Opinion of Probable Construction Cost' section for cost estimate details.

The repair recommendation analysis resulted in total of 253 repair recommendations. No repairs were recommended for 34 line segments since no defects were identified, see Table 4 above. The list of repairs recommended is summarized in Table 6 below and is presented in greater detail by line segment, including the NASSCO PACP Quick Rating, a breakdown of repair recommendations, repair type, estimated I/I rate (gpm), and estimated average costs in Appendix E.

The format used, in Appendix E, to identify each line segment includes Basin Number (Basin No.), Upstream Manhole (UMH), and Downstream Manhole (UMH). In addition, each line segment outlines the following information:

- NASSCO Score
- Repair Type
- Defect Type
- Estimated Distance from upstream manhole at which repair should take place



- o Estimated I/I Rate (Total of 136.4 gpm)
- o Estimated Average Cost (Total of \$808,900 with a 15% contingency)

Table 6
Total Repair Recommendation

Repair Description	Count
Sectional Liner	79
T-Liner / Top Hats	77
Clean, Test, Seal Main Line	49
Cured-in-Place Liner	32
Investigate Suspect Lateral*	7
Excavated Point Repair Main Line	4
Excavated Point Repair Lateral (Public Property)	2
Deroot Main Line	2
Repair Leaks in Manhole Channel	1
Total	253

* Laterals that show blockage of 50% or more and two (2) laterals with heavy and clear flow which was possible to visually confirm.

The line segments with their corresponding information were sorted using the NASSCO Score from highest (most critical defects) to lowest (no defects). See Appendix E.

Based on previous experience with similar gravity sewer systems in South Florida and the Lift station data discussed in Section 4 – Infiltration and Inflow Evaluation, about 35% of all sewer laterals contribute to the I/I flow. Therefore, King recommends the implementation of a suspect lateral inspection protocol for the entire gravity sewer system as part of the regular I/I program as detailed in Section – 1 – Video Review and R&R Identification. The Town's owned and maintained gravity sewer system has approximately 1,100 sewer laterals of which 86 were identified as requiring repair, representing 8% of the total based on available/visible data only.

The Town has started the installation of new cover inserts (inflow dish) for all existing manholes within the Town's owned and maintained sanitary sewer system in order to restrict the rate of inflow during rain events. Such installations are expected to be completed by January 2012.

Planning Level Opinion of Probable Construction Cost

The costs of trenchless, dig-and-replace, and lateral lining methods from recent bids were used to estimate the cost to repair the gravity sewer main lines and sewer laterals. These methods included CIPP, sectional liners, T-Liners / Top Hats, clean, test, and seal mainline (grouting), excavated point repair, and line replacement. These costs are influenced by the diameter of the pipe, the length of pipe requiring rehabilitation, depth of pipe, and the nature of the defects, such as cracks, roots, joint offsets, and others. Appendix H provides a summary of these repair costs.

The total estimated costs to repair the defects identified in Section – 1 – Video Review and R&R Identification are summarized in Table 7 and presented in greater detail in Appendix I.



Table 7
Planning Level Opinion of Probable Construction Cost

Rehabilitation	Cost	Details
Gravity Sewer Main	\$ 425,403.00	See Appendix I
Sewer Laterals (repair defects visible from mainline only)	\$ 277,950.00	See Appendix I
Contingency (15%)	\$ 105,502.95	See Appendix I
Grand Total (Rounded)	\$ 808,900.00	

In addition, Table 8 summarizes the number of defects, the estimated I/I and repair costs by NASSCO score.

Table 8
Estimated Repair Costs

Ranking (1 st Character)	Count (each)	Estimated I/I (gpm)	Estimated Cost (\$)
5	58	121.6	\$ 435,580.00
4	31	10.9	\$ 131,818.00
3	29	3.9	\$ 104,620.00
2	4	0	\$ 9,270.00
1	9	0	\$ 22,065.00
Total	131	136.4	\$ 703,353.00

Based on the video review, it was estimated that the I/I rate is approximately 136 gallons per minute (gpm). However, additional groundwater and stormwater may enter the Town's gravity sewer system through defects (not visible from mainline) in sewer laterals, broken cleanouts and/or illegal connections such as down spouts, which was not possible to quantify because the Town's video recording protocol did not allow for it. In addition, these estimates do not fully account for rainfall dependant I/I (RDII).

The Town is charged a monthly "Fixed Charge Component" for LS # 12, A1A force main, Broward County reserve capacity, and prior year true-ups, if any. In addition, the Town is charged a "Volume Charge Component" to cover LS # 12 electrical, chemical, personnel, pumping, administrative and general expense, 25% surcharge, Seagrape lift station (LS 24) volumetric rate, and 2.5 % IR&R charge. After reviewing the Wastewater Service Agreement between LBTS and the City of Pompano Beach including the Annual Rate Adjustment letter from December 2008 – 2011, it was stated that the Town will pay \$2.052 per 1,000 gallons during 2012. In addition, it was noticed that every annual recalculation of the monthly fixed charge and volumetric rate increases by at least 9% and 5%, respectively. Based on the annual increments on volumetric rate, it is in the best interest of LBTS to drastically reduce I/I. The LBTS / Pompano Wastewater Service Agreement and Annual Rate Adjustment letter are included in Appendix J. Table 9 shows a summary of the Annual Rate Adjustment from 2009 to 2012.



Table 9
Estimated Wholesale Rate

Cost Components	Calendar Year			
	2009*	2010*	2011*	2012*
Fixed Monthly Charge	\$13,453.44	\$21,548.59	\$24,267.20	\$26,563.34
Increment per Year (%)		60.17%	12.62%	9.46%
Volumetric Rate per 1,000 gallons	1.596	1.677	1.917	2.052
Increment per Year (%)		5.08%	14.31%	7.04%

* Data obtained from the Wastewater Service Agreement between LBTS and the City of Pompano Beach from December 2008 - 2011.

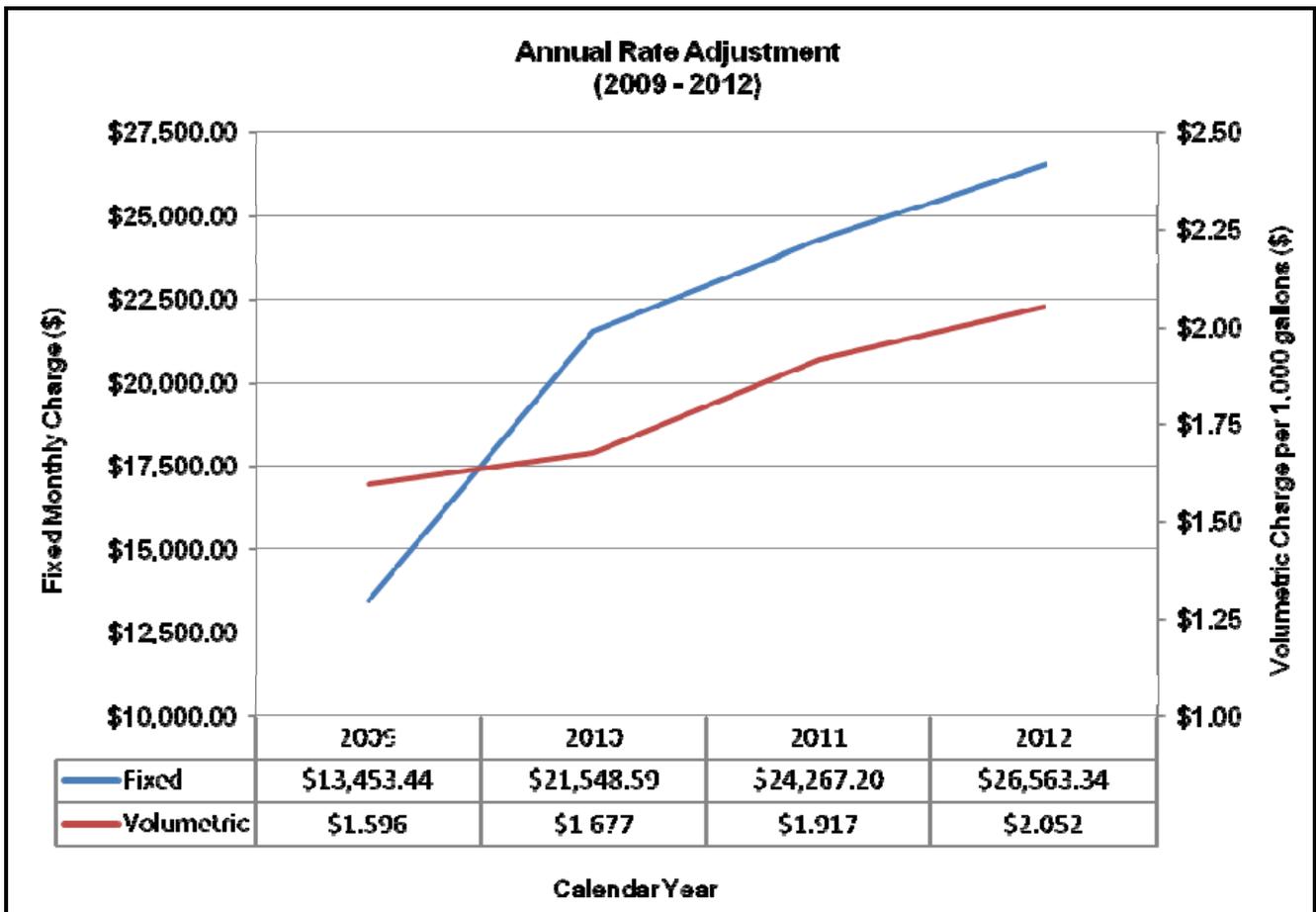


Figure 1. Annual Rate Adjustment

Figure 1 depicts the annual increase in the fixed monthly and volumetric charges from 2009 until now. As the volumetric charge increases yearly, the need for a comprehensive I/I program that reduces total metered flows becomes more important and extremely cost effective.

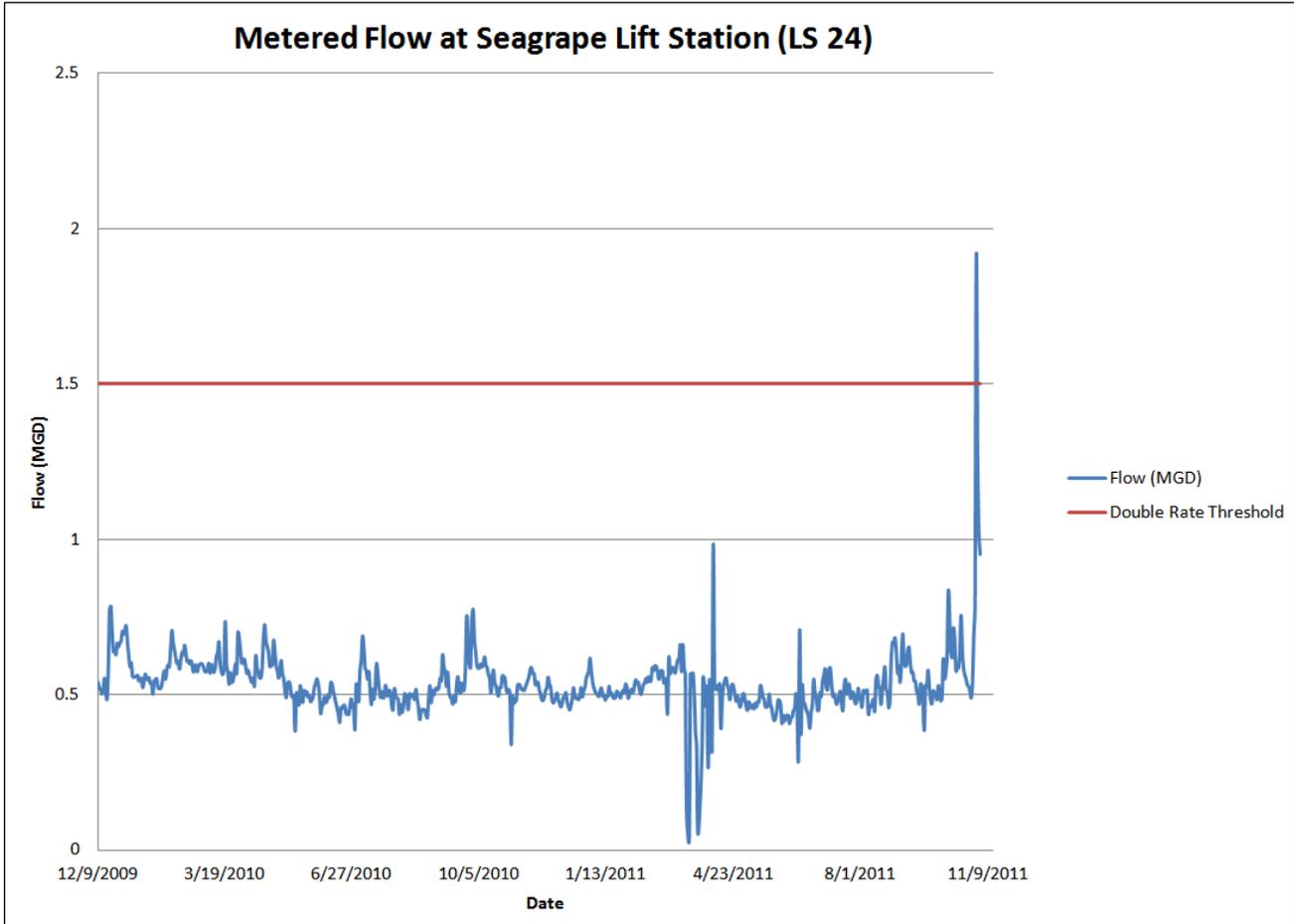


Figure 2. Daily Flow at Seagrape Lift Station - LS 24 (10)

It should also be noted that the Wastewater Service Agreement calls for double the volumetric charge on any day that the flow exceeds 1.5 MGD. As illustrated in Figure 2, this threshold is exceeded during a 2-year rain event. Also, Figure 3 summarizes the last 3 years wastewater billing.

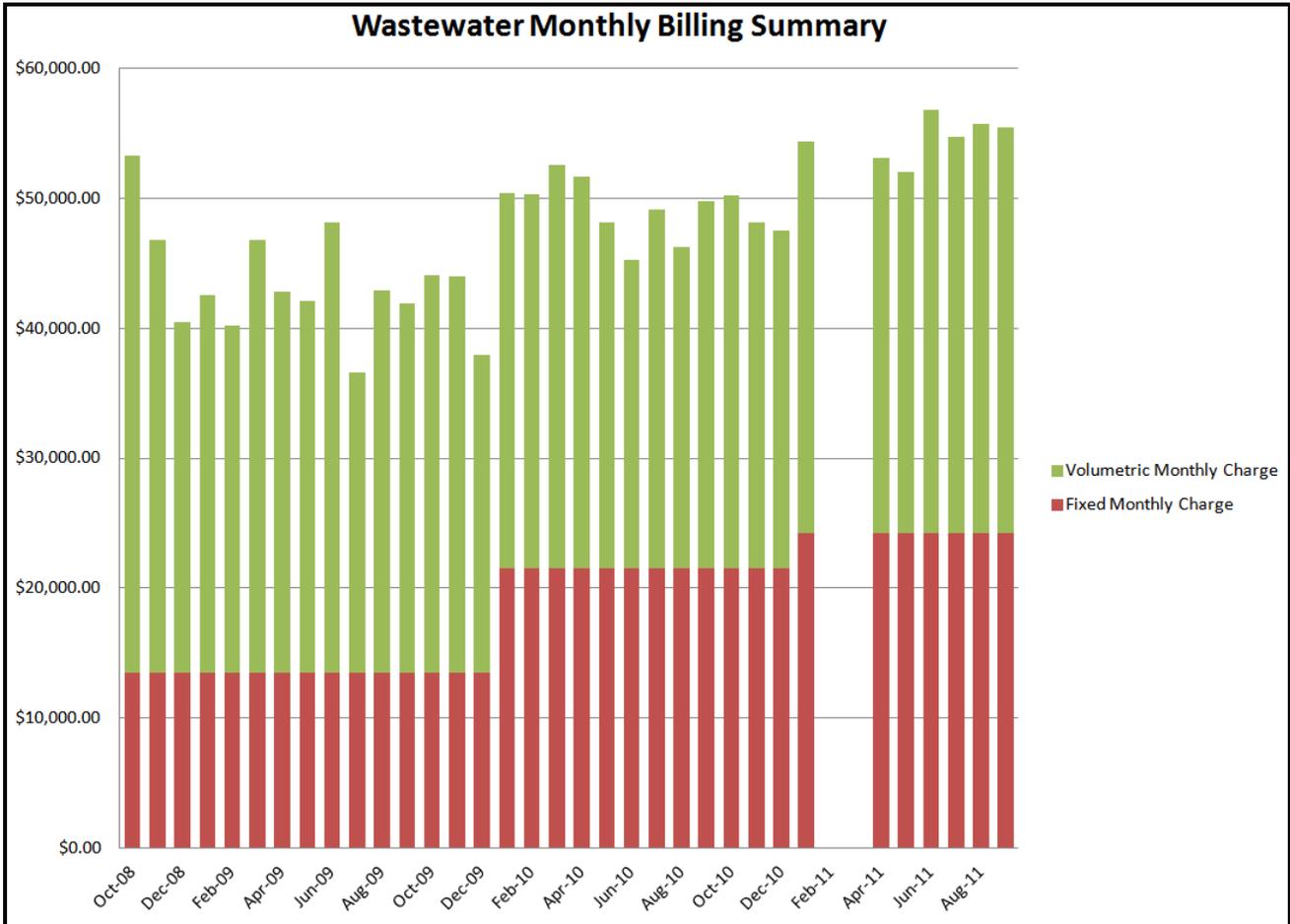


Figure 3. Wastewater Monthly Billing Summary (2009-2011)

As discussed, the proposed 2012 fixed monthly charge is \$26,563.54 and the volumetric charge is \$2.052 per 1,000 gallons, as shown in Table 9. Potential savings resulting from I/I reduction are further discussed in Section 4 – Infiltration and Inflow Evaluation.

Summary of Recommendations

In summary, the following recommendations are made:

- Continue to install all new manhole seals throughout the entire gravity sewer system (165 MH's).
- Complete gravity sewer system repairs by NASSCO priority score.
- Perform Sanitary Sewer Evaluation Survey (SSES).
 - Cleaning and CCTV Inspection (continuing).
 - Smoke Testing (new).
- Continue to install new clean outs, as required.
- Continue to implement a Suspect Lateral I/I Program.



2 – FLOW METER EVALUATION

The Seagrape lift station (LS # 24) is equipped with a Rosemount Magnetic Flow meter sensor, Model No. 8750WA. Magnetic flow meters do not have any moving parts and are well suited for wastewater applications. The velocity range on this model is between 0.01 and 39 feet per second for both forward and reverse flow, which relates to a flow range of 5 to 18,711 gpm. P.C. Controls, Inc. installed the meter on December 8, 2009, including a remote transmitter (Model No. 8712), and provides routine maintenance and calibration of the meter every three months. The maintenance costs are billed to the City of Pompano Beach and are part of Pompano's monthly bill to LBTS. The flow meter should provide as much as ten more years of service, as long as it is properly maintained and routinely calibrated as required in the Inter-local Agreement between LBTS and the City of Pompano Beach.



Rosemount Magnetic Flow Meter

Transmitter

According to the Reference Manual, Rosemount sensors are flow-calibrated and assigned a calibration factor at the factory. The calibration factor is entered into the transmitter, enabling interchangeability of sensors without calculations or a compromise in accuracy. The flow meter at the Seagrape lift station (LS # 24) has a self-verification module that maintains calibration. In addition, P.C. Controls, Inc. tests and calibrates the magnetic flow meter every 3 months using a hand held National Institute of Standards and Technology (NIST) certified flow meter. Calibration checks were performed on June 22, 2010, November 1, 2010, and May 16, 2011. The measured flow results were all within tolerance values every time the flow meter was tested. PC controls provides a 'Certified Flow Meter Test Record' once a year (last provided on November 1, 2010). The last certified flow meter test record shows that the meter tested within 0.2% margin of error. For a detailed log of installation and calibration dates, see Appendix K.

The inspection of the electrical components of the flow meter on October 5, 2011 found everything to be properly maintained and in good operating conditions. The meter has a reliable ground path between the sensor and the process fluid.

The sensor is installed in a position that ensures the sensor remains full during operation and is mounted so that the forward end of the flow arrow, shown on the sensor, points in the direction of flow through the sensor. The manufacturer's specifications call for the sensor to be installed a minimum of five straight pipe diameters upstream and two pipe diameters downstream from the electrode plane in order to ensure specification accuracy over widely varying process conditions. Field measurements were 16.5 feet downstream and 30 feet upstream, well above the minimum criteria for a 14-inch pipe.

Recommendations

- Continue testing and calibrating meter every 3 months
- Continue performing yearly 'Certified Flow Meter Test Record'
- Meter to be replaced in approximately 10 years



3 – LIFT STATIONS INSPECTION & EVALUATION

In order to determine if the current pumping capacity is sufficient to meet current and future demands and to assess the overall condition of the lift stations, the Hibiscus (LS # 25) and Seagrape (LS # 24) lift stations were inspected on October 5, 2011 and evaluated including a hydraulic analysis, spacing requirements, and electrical requirements. No structural assessment was included in this evaluation.

In order to evaluate lift station capacity, current and future demands were estimated using a design rate of 110 gallons per capita per day and using a “design” peaking factor of 3.9, meeting minimum Ten-State Standards requirements. The population for each service area was estimated by ratio using 2010 Census data obtained from the US Census Bureau, while projected population was estimated using FDOT’s ‘Traffic Analysis Zones’ (TAZ) 2035 projections. However, TAZ projections are considered to be conservative because the Town currently has a 3-story building height limitation, which is expected to limit growth.

As discussed with Broward County’s Development and Environmental Regulation Division, the following standards were used to determine if the Town lift stations comply with Broward County design criteria for lift stations:

1. 10 States Standards - Pumps shall have capacity such that, with any pump out of service, the remaining pumps will have capacity to handle the design peak hourly flow. The lift station design capacity shall be based on peak hourly flow (currently used).
2. NAPOT - Each lift stations shall demonstrate a nominal average pump operating time (NAPOT) of less than or equal to ten (10) hours per day for duplex pump stations and sixteen (16) hours per day for triplex pump stations.

In addition, a potential future criterion is the Peak Flow Criteria, which requires that, with any pump out of service, the remaining pumps shall have the capacity to handle the design peak hourly flow during a storm event. A typical design storm event used is the 2-year, 24-hour storm (4.5 inches). However, this is not a Broward County requirement at this time.

HIBISCUS LIFT STATION – LS # 25 (2)

Location

The Hibiscus lift station (LS # 25) is located on the Southeast corner of the intersection of Hibiscus Avenue and Allenwood Drive in Lauderdale-By-The-Sea. The lift station is physically located adjacent to a residential condominium’s parking lot. Specifically, the wet well, valve box, electrical panel, and telemetry antenna are located on the Northwest corner of the condominium. See vicinity map shown in Appendix L.

Description

The Hibiscus lift station’s (LS # 25) service area encompasses a mostly residential area with some commercial development. The collection area covers approximately 41 acres, consisting of 28 manholes and approximately 7,380 linear feet of 8 and 10-inch gravity sewer pipe. The lift station discharges through a 6-inch force main into MH # 56 on Seagrape Drive just north of the intersection with Hibiscus Avenue. See service area and flow diagram in Appendix M.



Hibiscus Lift Station



Hibiscus lift station (LS # 25 (2)) is a submersible wet well lift station. It has two (2) EBARA submersible non-clog pumps; model number 100 DLMF 65.5, 7.5 HP motors, and 6-inch discharge piping. The lift station was renovated in November 2002. Incoming power to the lift station is provided as 240 volt, 3 phase, from a pole mounted Florida Power & Light (FP&L) transformer on the North side of Hibiscus Avenue directly across from the lift station. As of November 3, 2011, the Nominal Average Pump Operating Time (NAPOT) of the Hibiscus lift station (LS # 25 (2)) is 2.53 hours, well below the 10 hour NAPOT criteria. See Table 10 for more details. NAPOT was estimated as the average of the values in Table 10.

Table 10
Hibiscus Lift Station – LS 25 (2) Monthly Average Run Time Summary

Monthly Average Run Time (hrs)	
November 2010	3.18
December 2010	1.99
January 2011	2.92
February 2011	2.81
March 2011	2.81
April 2011	2.34
May 2011	1.99
June 2011	1.97
July 2011	2.04
August 2011	2.40
September 2011	2.35
October 2011	3.60
Total	2.53

The concrete wet well is 6-foot diameter with an opening of 36" x 48" and an appropriate depth of 18 feet. The wet well interior is coated with coal tar epoxy, but is beginning to experience deterioration, shown by areas of pitting and minor sloughing from the top inch (+/-) of concrete as seen in Appendix N. Site inspection verified one (1) 8-inch and one (1) 10-inch influent gravity sewers discharging into the wet well from the South and from the North, respectively. The aluminum access hatch is in good condition.

The existing valve vault is constructed of cast-in place concrete, is coated with coal tar epoxy and is in relatively good condition (Appendix N). The aluminum access hatch is 36" x 48". Any rainwater intrusion into the valve vault is drained into the wet well via a 2-inch PVC pipe. The valve piping is painted but shows some signs of rusting where the pipe is exposed. The aluminum access hatch is in good condition.

The lift station is equipped with a manual transfer switch, a lift station control panel, and a remote telemetry system. The manual transfer switch is service entrance rated and equipped with a generator receptacle for connection to a portable generator for emergency backup power. The City of Pompano Beach maintenance personnel maintain a portable generator to be used in emergency situations. The lift station electrical service, lift station control panel, and telemetry system are located adjacent to the pump station. See Appendix N.

The lift station control panel utilizes a Bubbler Type level control and full voltage starter controllers for pump operation. Pumps are capable of being operated automatically via the bubbler type level control system or manually at the front of the station control panel. Pumps were operated in the automatic and manual mode and both modes functioned as intended. The lift station control panel has minor corrosion due to the enclosure door gaskets deteriorating. Otherwise, all electrical components evaluated are in good condition.



Hibiscus Control Panel



The fasteners holding the submersible pump fittings were observed for vibration during the testing of the pumps and the bubbler system and seem to be structurally sound. No excessive vibration was observed during the testing of both pumps. The pump guide rails are 2.25 inches in diameter and made of type 316 stainless steel and appeared to be properly restrained and connected to the 6-inch diameter base elbow fittings. The pumps are lifted via 1½-inch links stainless steel chain connected to the pump hook. Both chains are in good condition.

Mechanical Upgrades & Pump Selection

Hydraulic calculations for the lift station (Appendix O) were performed in order to determine if the pumps operate within the design range by plotting a system curve on the pump curve and checking versus pump down test results. A pump down test was performed for both pumps at the Hibiscus lift station (LS # 25). The test involved measuring the rise of wastewater for one minute, then, for each pump, measuring the fall of wastewater for one minute. Given the size of the wet well, this allows for a calculation of each pump's pumping rate by adding the rise and fall (in inches) and multiplying by the volume in one inch of wet well. Pumps 1 and 2 were found to be pumping at a rate of approximately 396 gpm. Then, using the measured gauge pressure and calculated minor losses, the flow versus the total dynamic head (TDH) was plotted on the pump curve, as shown in Appendix P. Both pumps were found to be operating within the design range for their model.

From the 2010 Census, the population in the Hibiscus service area was estimated to be 433 permanent residents with a seasonal peak of 715 residents. Current domestic flow is calculated to be 47,630 GPD (33 gpm) permanent with a peak of 78,650 GPD (55 gpm) during the winter months. Using a "design" peaking factor of 3.9, current peak hour flow is estimated to be 214.5 gpm during the dry season and 129 gpm during the wet season. The 2035 projected population for the Hibiscus service area was estimated to be 587 permanent residents with a seasonal peak of 969 residents. 2035 domestic flow is estimated to be 64,570 GPD (45 gpm) permanent with a peak of 106,590 GPD (74 gpm) during the winter months. Applying the 3.9 design peaking factor, 2035 peak hour flow is estimated to be 289 gpm during the dry season and 175.5 gpm during the wet season. I/I was assumed to stay approximately the same and was estimated as a 5 day average night flow based on the wet and dry season hydrographs. The existing pumps should have enough capacity to handle current and projected 2035 flows during both the wet and dry seasons. Table 11 summarizes the demand calculations. It should be noted that although I/I rates are higher during the wet season (30 gpm); total peak hour flow is higher for the dry season due to a higher seasonal population in the winter months.

Table 11
Hibiscus Lift Station – LS 25 (2) Current and Future Demands

2010 Population		Current Domestic Flow (GPD)	Estimated I/I (gpm)	Design Peaking Factor	2010 Peak Hour Flow (gpm)
Permanent (Wet Season)	433	47,630	30 gpm	3.9	129
Seasonal (Dry Season)	715	160,875	20 gpm	3.9	214.5
2035 Population		Projected Domestic Flow (GPD)	Estimated I/I (gpm)	Peaking Factor	2035 Peak Hour Flow (gpm)
Permanent (Wet Season)	587	64,570	30 gpm	3.9	175.5
Seasonal (Dry Season)	969	106,590	20 gpm	3.9	289



Recommendations

The site appeared to be properly maintained, including proper signage and landscaping. No site modifications are anticipated. The following are recommended:

- Sandblast and apply two fresh coats of coal tar epoxy or a similar treatment to the wet well in order to protect the concrete from further deterioration. This treatment should include the lift station's discharge piping which is beginning to rust. After sandblasting, the concrete should be further evaluated to determine if repairs are necessary.
- The valve vault piping should also be sandblasted and given two coats of industrial quality paint to protect from rusting.
- The pump on level should be moved to 6 inches below the lowest invert. This will allow for slightly longer pump cycles and less pump start ups.

Electrical Upgrades

It is recommended to replace the control panel door gaskets and install electrical duct seal (putty) in all the conduits entering into the lift station control panel to prevent further deterioration of the electrical components.

SEAGRAPE LIFT STATION – LS # 24 (10)

Location

The Seagrape lift station (LS # 24 (10)) is located on the West side of Seagrape Drive between Commercial Boulevard and Harbor Drive in LBTS. The lift station is physically located adjacent to the Bank United parking lot and its valve box and magnetic flow meter box are within its parking spaces. See vicinity map shown in Appendix L.

Description

The Seagrape lift station (LS # 24 (10)) service area encompasses a mostly residential area with some commercial development. The collection area covers approximately 184 acres, consisting of 137 manholes and approximately 39,023 linear feet of 8, 10, 12, 15, 18 and 24-inch gravity sewer pipe. The lift station discharges through a 14-inch force main that manifolds with other force mains that together discharge into the Pompano Beach utilities Master Lift Station (LS # 12). See service area and flow diagram in Appendix M.



Seagrape Lift Station

The Seagrape lift station (LS # 24 (10)) is a converted submersible wet well lift station. It has two (2) EBARA submersible non-clog pumps; model number 250DLFU645, 60 HP motors, and 10-inch discharge piping. The lift station was converted from a dry pit/wet well lift station to a submersible lift station in June 2000. In addition, pump 2 was rebuilt on June 22, 2011. Incoming power to the lift station is provided as 480 volt, 3 phase, from a pad mounted Florida Power & Light (FP&L) transformer adjacent to the wet well. As of November 3, 2011, the Nominal Average Pump Operating Time (NAPOT) of LS 24 (10) is 6.78 hours, below the 10 hour NAPOT criteria. See Table 12 for more details. NAPOT was estimated as the average of the values in Table 12.



Table 12
Seagrape Lift Station – LS 24 (10) Monthly Average Run Time Summary

Monthly Average Run Time (hrs)	
November 2010	11.40
December 2010	6.12
January 2011	5.20
February 2011	5.53
March 2011	7.67
April 2011	7.97
May 2011	6.48
June 2011	5.32
July 2011	5.17
August 2011	5.49
September 2011	5.95
October 2011	9.14
Total	6.78

The concrete wet well is 9-foot by 9-foot with two 36" x 48" openings and an approximate depth of 26.85 feet. The wet well interior is coated with coal tar epoxy, and is in relatively good condition. Site inspection verified one (1) 24-inch influent gravity sewer discharging into the wet well from the East. The aluminum access hatches are in good condition.

The existing valve vault is constructed of cast-in place concrete and is in relatively good condition (Appendix N). The two (2) aluminum access hatches are 36" x 60". Any rainwater intrusion into the valve vault is drained via a sump that discharges into the wet well via a 6-inch PVC pipe. The valve piping is painted but shows some signs of rusting where the pipe is exposed. The aluminum access hatches are in good condition.

The lift station is equipped with an automatic transfer switch, a station control panel, a remote telemetry system, and a Cummins/Onan 3 phase 480 volt powered 100 kW stand-by diesel fuel powered generator located within a concrete control house. As part of the inspection, the lift station was operated on both utility and generator power. The station's main breaker was opened to simulate loss of utility power. The generator started and the transfer switch operated correctly. The lift station was operated on generator power without incident. Some surface rust was observed on the generator fuel tank and the generator breaker enclosure was found to be missing the conduit knock out seal. The generator battery charger indicates that everything in the charging system is operating properly, although it appears that the generator's hour meter was not working properly.

The lift station control panel utilizes a Bubbler Type level control and soft start controllers for pump operation. Pumps are capable of being operated automatically via the bubbler type level control system or manually at the front of the lift station control panel. Pumps were operated in the automatic and manual mode and both modes functioned as intended. The pump # 2 soft start controller has been recently replaced. The station control panel has evidence of minor corrosion on the electrical copper components due to gasses associated with the wet well; otherwise, all electrical components evaluated are in good condition. The station main circuit breaker, remote telemetry system (RTU), and wiring are in good condition.



Seagrape Electrical Components

The fasteners holding the submersible pump fittings were observed for vibration during the testing of the pumps and the bubbler system and seem to be structurally sound. No excessive vibration was observed during the testing of both pumps. The pump guide rails are 3 inches in diameter and made of type 316 stainless steel and appeared to be properly restrained and connected to the 10-inch diameter base elbow



fittings. The pumps are lifted via 2-inch links stainless steel chain connected to the pump hook. Both chains are in good condition.

Mechanical Upgrades & Pump Selection

Hydraulic calculations for the lift station (Appendix O) were performed in order to determine if the pumps operate within the design range. Since there are numerous private lift stations connected to the Seagrape discharge force main, it was not possible to accurately develop a system curve for the Seagrape lift station. The average minimum and maximum pressure readings over an eight day period (7/19/2011 – 7/26/2011) provided by Pompano Beach personnel were used to determine the pumps operating range, as shown in Appendix P. A pump down test was performed for both pumps at the Seagrape station on 10/05/2011. The test involved measuring the rise of wastewater for one minute, then, for each pump, measuring the fall of wastewater for one minute. Given the size of the wet well, this allows for a calculation of each pump’s pumping rate by adding the rise and fall (in inches) and multiplying by the volume in one inch of wet well. Pump 1 was found to be pumping at a rate of 1,010 gpm and Pump 2 at a rate of 808 gpm. Both pumps were found to be operating within the operating range for their model.

Several factors may be affecting the difference in pumping rate between Pump 1 and Pump 2. These are as follows:

- Pump 2 may have a worn impeller which may require replacement, but it is unlikely since it was recently rehabilitated.
- According to Pompano Beach maintenance staff, Pump 2 is closer to the influent pipe and periodically requires debris such as rags to be removed from its impeller.
- The check valve for Pump 1 may not be closing properly when Pump 2 is operating, therefore allowing for a portion of the flow to recycle into the wet well.

From the 2010 Census, the population in the Seagrape service area was estimated to be 1,944 permanent residents with a seasonal peak of 3,212 residents. Current domestic flow is calculated to be 213,840 GPD (148.5 gpm) permanent with a peak of 353,320 GPD (245 gpm) during the winter months. Since the Hibiscus pump station pumps into a manhole in the Seagrape service area, these domestic flows include the calculated Hibiscus domestic flow. Using a “design” peaking factor of 3.9, peak hour flow is estimated to be 955.5 gpm during the dry season (November – April) and 579 gpm during the wet season (May-October). The 2035 projected population for the Seagrape service area was estimated to be 2,975 permanent residents with a seasonal peak of 4,915 residents. 2035 domestic flow is estimated to be 327,250 GPD (227 gpm) permanent with a peak of 540,650 GPD (375 gpm) during the winter months. Applying the 3.9 design peaking factor from the 10-State Standards, 2035 peak hour flow is estimated to be 1,462.5 gpm during the dry season and 885 gpm during the wet season. The existing pumps should have enough capacity to handle projected 2035 flows during both the wet and dry seasons as long as I/I remains constant and does not increase, and no major increases in discharge pressures are experienced. Table 13 summarizes the demand calculations. It should be noted that although I/I rates are higher during the wet season (152 gpm), total peak hour flow is higher for the dry season due to a higher seasonal population in the winter months.

Table 13
Seagrape Lift Station – LS 24 (10) Current and Future Demands

2010 Population		Current Domestic Flow (GPD)	Estimated I/I (gpm)	Peaking Factor	2010 Peak Hour Flow (gpm)
Permanent (Wet Season)	1,944	213,840	152 gpm	3.9	579
Seasonal (Dry Season)	3,212	353,320	114 gpm	3.9	955.5
2035 Population		Projected Domestic Flow (GPD)	Estimated I/I (gpm)	Peaking Factor	2035 Peak Hour Flow (gpm)
Permanent (Wet Season)	2,975	801,450	152 gpm	3.9	885
Seasonal (Dry Season)	4,915	1,323,900	114 gpm	3.9	1,462.5



Recommendations

The site appeared to be properly maintained, including proper signage and landscaping. The following are recommended:

- There is an existing Silver Buttonwood tree that has grown too close to the control house and should be trimmed.
- The soffit and fascia around the generator exhaust is slightly damaged and should be fixed.
- It is recommended to sandblast and apply two fresh coats of coal tar epoxy or a similar treatment the wet well in order to protect the concrete from further deterioration. After sandblasting, the concrete should be further evaluated to determine if repairs are necessary.
- The valve vault piping should also be sandblasted and given two coats of industrial quality paint to protect from rusting.
- The pump "on" level should be moved to 6 inches below the invert. This will allow for slightly longer pump cycles and less pump start ups, which should save on energy costs. In order to ensure that both pumps are operating at the same rate, it is recommended that the Pump 2 impeller is checked for wear and tear or debris and is cleaned or replaced as needed. LBTSS may want to confirm with EBARA on proper impeller size.
- It is also recommended to inspect the check valves to ensure that they are operating properly and not allowing any flow to recycle into the wet well.

Electrical Upgrades

- It is recommended to install a 2" x 3" plastic phenolic label on the front of the service disconnect enclosure to identify the service disconnect for the station and an identification label on the automatic transfer switch.
- A sign at the Utility Meter Can should be posted to indicate that the station main service disconnect switch and an alternate source of power are located inside the control house.
- In order to protect the electrical copper components inside the control panel from further deterioration, it is recommended to install electrical duct seal (putty) in all the conduits entering into the control panel.
- The generator run time meter seems to not be functioning and should be replaced.
- Given the inaccuracy of the generator run time meter, it is recommended to perform a generator load bank test. A proposal to perform the test from the manufacturer has been included in Appendix Q.
- It is recommended that the generator fuel tank rust is cleaned, touch up paint is applied as needed, and a knock out seal is installed to the generator breaker enclosure.
- It is expected that the existing generator will require replacement in 10 years. A quote for a replacement generator is included in Appendix Q.



4 – INFILTRATION AND INFLOW EVALUATION

A gravity sewer system may be subject to infiltration and inflow which reduce its capacity and capability to transport sewage to treatment facilities. This added flow raises the total treatment costs of the sewage at the treatment plant, or in the case of LBTS, the total cost to the City of Pompano Beach for which LBTS is responsible.

Infiltration is groundwater that enters the gravity sewer system through holes, breaks, joint failures, connection failures and other openings. Infiltration responds directly to groundwater levels (and tide levels for coastal regions), and is thus at its highest during the rainy season with its peak typically in October, and especially following significant rain events when the ground becomes saturated.

Inflow is direct runoff that enters the gravity sewer system through illegal or improper connections (such as roof drains and catch basins) or through faulty, poorly sealed, or missing manhole covers and/or laterals clean out caps. Inflow contributes a significant amount of pollutants, especially during rain events following dry spells. Grease, oils, pesticides, and other pollutants are flushed from the surfaces where they have been accumulating into the gravity sewer system. Thus, inflow increases peak flows to the treatment plant as well as pollutant load. Figure 4 depicts a schematic of different sources of I/I.

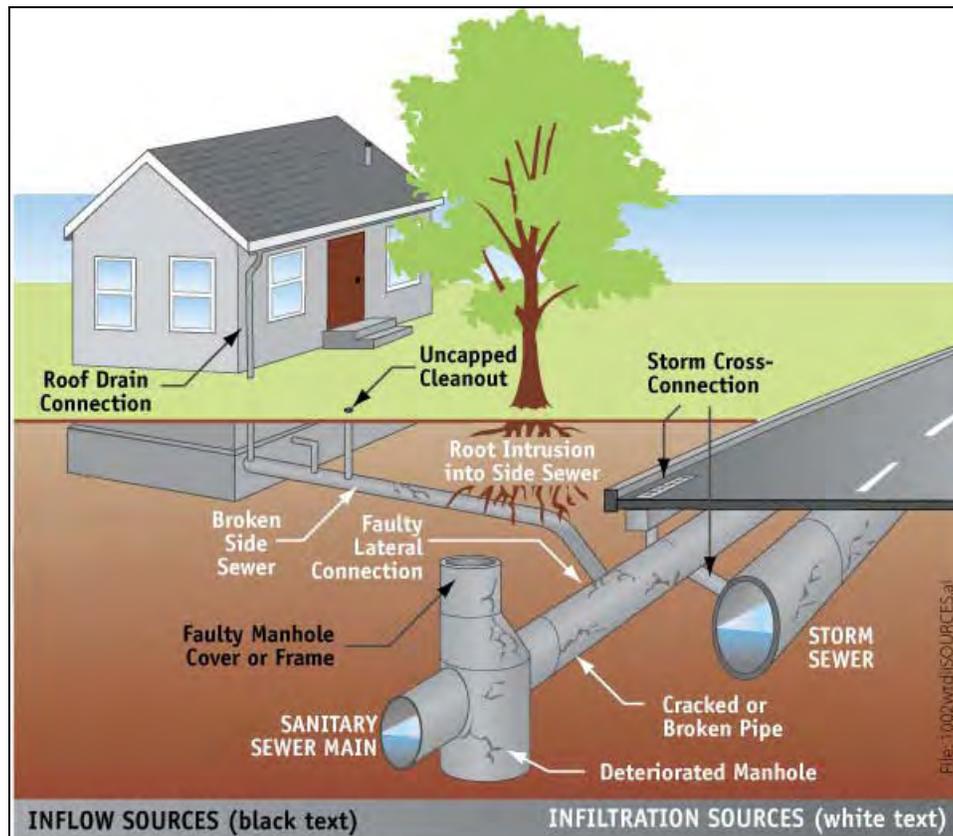


Figure 4. I/I Sources (Source: <http://www.kingcounty.gov/environment/wastewater/II/What.aspx>)

Dry and Wet Weather Hydrographs

In order to determine the total infiltration and inflow into the gravity sewer system and to estimate the contribution from groundwater, tidal effect, and rain, dry weather and wet weather hydrographs were determined for each lift station. The lowest flow in the dry weather hydrograph, the night flow, yields the total infiltration into the gravity sewer system due to groundwater. The dry weather night flow is also used to



estimate any tidal effect by overlaying a corresponding high tide event and checking for any increase in flow.

Wet weather hydrographs are used to determine rain dependent infiltration and inflow (RDII). A wet weather diurnal hydrograph for a period in the wet season that had no or minimal rain is overlaid on the 24-hour hydrograph corresponding with a 2-year storm event (4.5 inch intensity in a 24-hr period). The area between the two hydrographs yields the total volume of RDII, while the difference between the peak of the storm hydrograph and the “dry” hydrograph provides the peak RDII.

A separate hydrograph analysis was performed for the two service areas, although ultimately the total I/I determined for the Seagrape service area also accounts for the Hibiscus I/I since all of the Hibiscus flow is pumped into the Seagrape gravity sewer system.

Lift station data for the analysis was provided by Pompano Beach Utilities. These data included:

- Lift station run times used to estimate each lift station’s NAPOT.
- Lift station on and off times used to calculate Average Hourly Flow (AHF) for each lift station and Average Annual Daily Flow (AADF).
- Flow meter measurements taken at the Seagrape lift station (LS # 24) used to calibrate the calculated AHF.

Groundwater levels and rainfall data were obtained through the South Florida Water Management District (SFWMD) DBHYDRO database. This data included:

- Groundwater station G-853_G (only available up to September 6, 2011). This data set includes daily groundwater elevations.
- Rainfall gauge S36-R. This data set includes daily rainfall totals and hourly rainfall totals from October 4, 2010 to November 1, 2011.
- A Hydrologic Monitoring - Active Well Sites Map and a Hydrologic Monitoring - Active Rain Gauge Sites Map (shown in Appendix R).

Tide data were downloaded from the NOAA website. In the absence of local data, the NOAA gauge at Lake Worth (station ID 8722670) was used as generally representative of tidal conditions within the study area.

The Environmental Protection Agency (EPA) typically requires mainline repairs to be done once the gallons per day per inch-mile (GDPIM) exceed 5,000. However, it should be noted that EPA is currently considering lowering this standard to 1,000 GDPIM.

Hibiscus (LS # 25 (2)) I/I Analysis

As was previously stated, the Hibiscus service area is predominantly residential. As such, the diurnal curve is expected to follow a general pattern with a peak in the morning (7-9 am) and a second peak in the evening (6-8 pm). The night flow is expected in the early am hours (2-4 am). The dry weather hydrograph was developed for five weekdays (3/21/11 – 3/25/11), in the heart of the dry season during a particularly dry year as evidenced by the low groundwater table (see Figure 5 and Figure 6). See Appendix S for details. The groundwater infiltration is estimated to be 21 gpm based on the average 5-day night flow from the dry weather hydrograph. Dry weather peak flow for the selected time period averages 71 gpm, with an average daily flow (ADF) of 45 gpm. Demand is calculated by subtracting infiltration from the ADF, and is estimated at 24 gpm.



A second dry weather hydrograph was developed for 3/21/11 – 3/22/11, matching the night flow time period with a high tide cycle (see Figure 7). Infiltration due to the tidal cycle is estimated to be approximately 2 gpm or 10% of total flow, as can be seen by the small jump in night flow compared to the dry weather hydrograph in Figure 6. These figures are provided in Appendix S in 11x17 format.

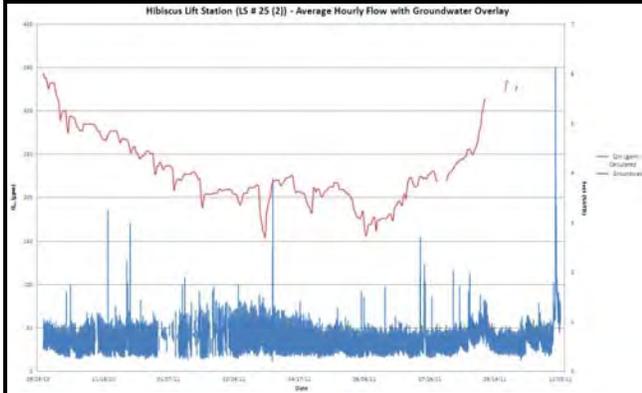


Figure 5. Average Hourly Flow with Groundwater Overlay

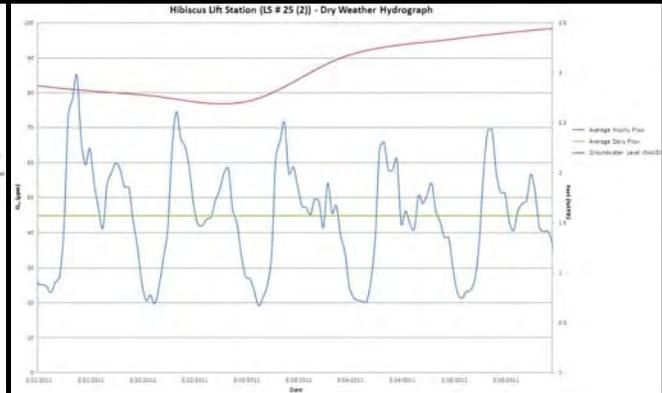


Figure 6. Dry Weather Hydrograph

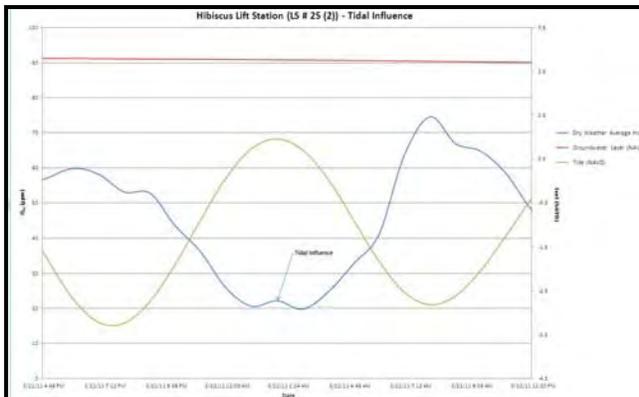


Figure 7. Tidal Influence



Figure 8. Wet Weather Flow with Related Rainfall Hyetograph

Pump “On” and “Off” data were provided dating back to October 2010. Since that date, all rain events in Broward County have been below 2 inches. The only 2-year event in that record occurred in October 2011. Therefore, a wet weather hydrograph was developed for the 24 hours corresponding to a substantial rain event (5.67 inches) from 10/30/11 1 pm to 10/31/11 1 pm. In order to quantify the total volume of RDII, the 5-day average dry weather hydrograph was overlapped with the wet weather hydrograph (see Figure 8). The difference between the two hydrographs yields the RDII for this storm event. The total volume of RDII for this rain event was 209,560 gallons, adjusted to the design 4.5-inch storm event equals to 166,317 gallons. The peak hour flow was calculated to be 350 gpm, which yields a peak RDII of 329 gpm. Adjusted to the design 4.5-inch storm event the peak hour flow and peak RDII are 278 and 261 gpm, respectively. The adjusted peak hour flow is divided by the Average Annual Daily Flow (AADF) of 39 gpm to yield a Peaking Factor (PF) of 7.13. Table 14 summarizes the results for the Hibiscus lift station (LS # 25).

Table 14
Hibiscus Lift Station – LS 25 (2) Hydrograph Analysis Results

Dry Weather Night Flow	Tidal Infiltration	Wet Weather Night Flow	Peak Hour (Dry)	Peak Hour (4.5-inch storm)	Average Annual Daily Flow	Peak Factor	Peak RDII	GDPIM
21 gpm	2 gpm	30 gpm	71 gpm	278 gpm	39 gpm	7.13	261 gpm	3,272



Seagrape (LS # 24 (10)) I/I Analysis

The Seagrape service area is also predominantly residential with some commercial development. As such, the diurnal curve is expected to follow a general pattern with a peak in the morning (7-9 am) and a second peak in the evening (6-8 pm). The night flow is expected in the early am hours (2-4 am). The dry weather hydrograph was developed for five weekdays (3/21/11 – 3/25/11), in the heart of the dry season during a particularly dry year as evidenced by the low groundwater table (see Figure 9 and Figure 10). The groundwater infiltration is estimated to be 114 gpm based on the average 5-day night flow from the dry weather hydrograph. Dry weather peak flow for the selected time period averages 359 gpm, with an average daily flow (ADF) of 243 gpm. Demand is calculated by subtracting infiltration from the ADF, and is estimated at 129 gpm.

A second dry weather hydrograph was developed for 3/23/11 – 3/24/11, matching the night flow time period with a high tide cycle (see Figure 11). Infiltration due to the tidal cycle is estimated to be approximately 10 gpm or 10% of total flow, as can be seen by the small jump in night flow compared to the dry weather hydrograph in Figure 10. These figures are provided in Appendix S in 11x17 format.

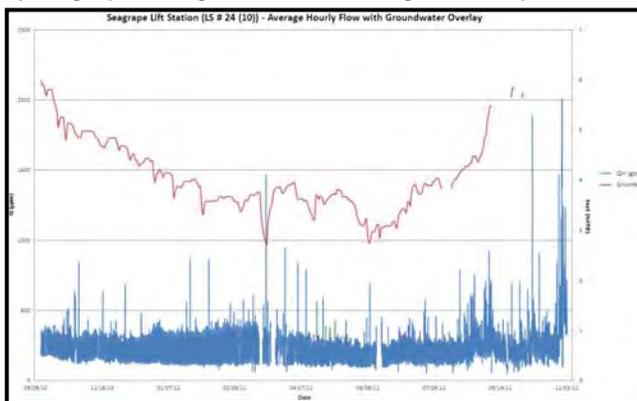


Figure 9. Average Hourly Flow with Groundwater Overlay

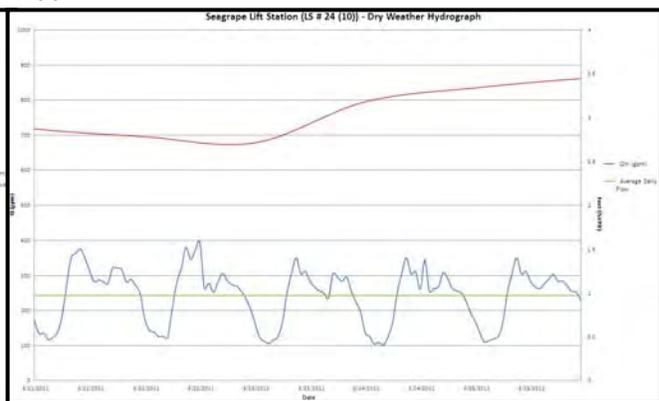


Figure 10. Dry Weather Hydrograph

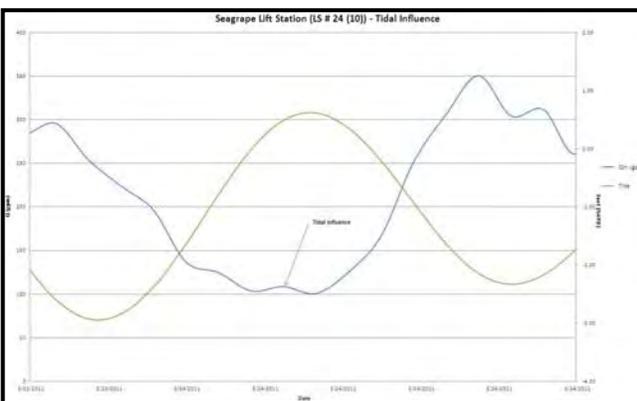


Figure 11. Tidal Influence

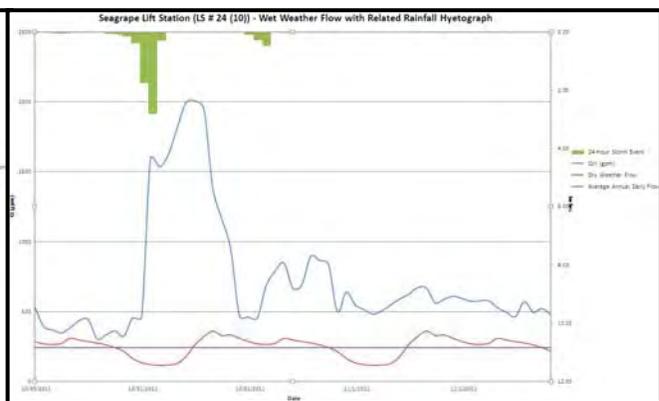


Figure 12. Wet Weather Flow with Related Rainfall Hyetograph

Pump "On" and "Off" data were provided dating back to October 2010. Since that date, all rain events in Broward County have been below 2 inches. The only 2-year event in that record occurred in October 2011. Therefore, a wet weather hydrograph was developed for the 24 hours corresponding to a substantial rain event (5.67 inches) from 10/30/11 1 pm to 10/31/11 1 pm. In order to quantify the total volume of RDII, the 5-day average dry weather hydrograph was overlapped with the wet weather hydrograph (see Figure 12). The difference between the two hydrographs yields the RDII for this storm event. The total volume of RDII for this rain event was 1,173,439 gallons, adjusted to the design 4.5-inch storm event equals to 931,301 gallons. The peak hour flow was calculated to be 2,008 gpm, which yields a peak RDII of 1,816 gpm.



Adjusted to the design 4.5-inch storm event the peak hour flow and peak RDII are 1,594 and 1,441 gpm, respectively. The adjusted peak hour flow is divided by the metered Average Annual Daily Flow (AADF) of 364 gpm to yield a Peaking Factor (PF) of 4.38. Table 15 summarizes the results for the Seagrape lift station (LS # 24 (10)).

Table 15
Seagrape Lift Station – LS 24 (10) Hydrograph Analysis Results

Dry Weather Night Flow	Tidal Infiltration	Wet Weather Night Flow	Peak Hour (Dry)	Peak Hour (4.5-inch storm)	AADF (SCADA)*	AADF (Metered)*	Peak Factor	Peak RDII	GDPIIM
114 gpm	10 gpm	152 gpm	359 gpm	1,594 gpm	241 gpm	364 gpm	4.38	1,441 gpm	2,915

*SCADA and Flow Meter AADF do not match because the SCADA flows, due to the methodology of calculation, exclude all peaks occurring during rain events (or any time the pump run time exceeds the pump off time). Peaking factor is best estimated using the metered AADF.

The average yearly Night Flow (groundwater infiltration) is estimated at 133 gpm. Therefore, of the 241 gpm calculated AADF (that does not include RDII), 55.2% is infiltration. Since meter data were available for the Seagrape lift station, the AADF (including RDII) can be calculated. In order to estimate total I/I, the ratio of infiltration to the SCADA AADF can be applied to the metered AADF. In this way, total average I/I is estimated to be 201 gpm. Estimated savings are presented in Table 16, ranging from 40% I/I reduction to 70% I/I reduction. A reasonable I/I reduction target is between 60 and 70%. LBTS could save between \$7,226 and \$12,646 per month by addressing the I/I issue. Payback periods based on the total repair recommendation costs outlined in Table 7 of Section 1 – Video Review and R&R Identification are outlined in Table 16.

Table 16
Saving Cost Analysis

Volumetric Charge per 1,000 gallons (\$) (2012)				
\$2.052				
Rehabilitation	Estimated I/I Reduction (gpm)	Savings per month (\$)	Savings per year (\$)	Payback Period (years)
70% I/I Reduction	140.7	\$12,646	\$151,749	6.40
60% I/I Reduction	120.6	\$10,839	\$130,071	7.46
50% I/I Reduction	100.5	\$9,033	\$108,392	8.96
40% I/I Reduction	80.4	\$7,226	\$86,714	11.20

It is therefore reasonable to expect a payback period between 7.5 and 6.4 years on repair costs by achieving a 60 – 70% I/I reduction rate.

Recommendations

As a result of the I/I analysis, King recommends the following:

- Implement a “Lift Station SCADA Monitoring Program” by updating the Hydrographs prepared for this study with monthly SCADA data.
- Continue to implement a Suspect Lateral I/I Program.
- Perform gravity sewer system repairs as outlined in Section 1 – Video Review and R&R Identification and implement an I/I Reduction Maintenance Program to include CCTV and smoke testing of the gravity sewer system.



5 – SANITARY SEWER CAPITAL IMPROVEMENTS PLAN (SSCIP)

A Sanitary Sewer Capital Improvement Plan (SSCIP) was prepared based on the work completed herein. The plan includes the costs of repairs to the gravity sewer lines and lift stations as well as the replacement costs of the lift stations and other key components of the sewer system. In addition, we have included costs related to a proposed Gravity Sewer System Capacity Evaluation Hydraulic Model, proposed Lift Station Monitoring Program, proposed Suspect Lateral I/I Program, and I/I Reduction Maintenance Program.

These costs do not include any sewer capacity line expansions that may be required to accommodate increased flows due to future growth. King recommends that the City moves ahead with the development of a gravity system sewer model to evaluate the need for future sewer line expansions. The gravity sewer model was included in the 2012 fiscal year budget.

The planning level opinion of probable cost developed herein included the following components:

- Construction cost
- Contingency – 15%
Engineering, Construction Management, and Inspection – 20%

Sewer defect repairs were estimated as discussed previously in Section 1 – Video Reivew and R&R Identification. Construction costs for equipment replacement were estimated based on experience and selected quotes.

Table 17 summarizes the list of projects and their “Description of Work” and “Cost Development Detail” recommended to be implemented for the next 10 years (2012 - 2021). For a detailed implementation schedule and estimated cost per project please refer to Appendix G.

Table 18 summarizes the list of projects and their “Description of Work” and “Cost Development Detail” that are currently being implemented.



Table 17
List of Projects and Capital Budget Plan Description

+Project		Description of Work	Cost Development Details
1	Gravity Sewer Rehabilitation Program		
1.1	Gravity Sewer Rehabilitation NASSCO Ranking 5	See Appendix "E"	\$500,900 Based on Appendix "E" plus 15% Contingency.
1.2	Gravity Sewer Rehabilitation NASSCO Ranking 4	See Appendix "E"	\$151,700 Based on Appendix "E" plus 15% Contingency.
1.3	Gravity Sewer Rehabilitation NASSCO Ranking 3	See Appendix "E"	\$120,400 Based on Appendix "E" plus 15% Contingency.
1.4	Gravity Sewer Rehabilitation NASSCO Ranking 2	See Appendix "E"	\$10,700 Based on Appendix "E" plus 15% Contingency.
1.5	Gravity Sewer Rehabilitation NASSCO Ranking 1	See Appendix "E"	\$25,400 Based on Appendix "E" plus 15% Contingency.
1.6	Engineering / CM / Inspection from item 1	<ul style="list-style-type: none"> • Engineer will prepare contract specifications, bidding services, provide construction management and inspection services during the construction of the recommended repairs shown in Appendix "F". 	\$809,100 x 15% = \$121,300 Based on 15% of total cost (items 1.1 to 1.5)
2	Hibiscus LS # 25 (2) Minor Repairs	<ul style="list-style-type: none"> • Move pump "on" level to 6 inches below the lowest invert. • Replace control panel door gaskets and install electrical duct seal (putty) in all the conduits entering into the pump station control panel. 	Based on recent bids and experience. \$500
		<ul style="list-style-type: none"> • Sandblast and coat with epoxy wet well concrete surfaces. • Sandblast and coat with epoxy pump station discharge piping. • Sandblast and coat with epoxy vault valve piping. 	Based on recent bids and experience. \$6,300



+Project		Description of Work	Cost Development Details
3	Seagrape LS # 24 (10) Minor Repairs	<ul style="list-style-type: none"> • Move pump “on” level to 6 inches below the lowest invert. • Install a 2” x 3” plastic phenolic label on front of service disconnect enclosure. • Install an identification label on automatic transfer switch. 	Based on recent bids and experience. \$1,000
		<ul style="list-style-type: none"> • Install electrical duct seal (putty) in all the conduits entering into the pump station control panel. • Sandblast and coat with epoxy wet well concrete surfaces. • Sandblast and coat with epoxy vault valve piping. 	Based on recent bids and experience. \$12,000
4	Hibiscus LS # 25 (2) Full Upgrade	<ul style="list-style-type: none"> • Replace pumps, motors, control panels, instrumentation, SCADA system, piping, valves, etc. • Sandblast and coat with epoxy wet well concrete surfaces. 	Based on recent bids and experience. \$268,000
5	Seagrape LS # 24 (10) Full Upgrade	<ul style="list-style-type: none"> • Replace pumps, motors, control panels, instrumentation, SCADA system, piping, valves, etc. • Sandblast and coat with epoxy wet well concrete surfaces. 	Based on recent bids and experience. \$783,000
6	Seagrape LS # 24 (10) Flow Meter Replacement	<ul style="list-style-type: none"> • Flow meter should be replaced as per manufacturer’s recommendation. 	As quoted by the manufacturer. \$15,700
7	Seagrape LS # 24 (10) Generator Load Bank Test	<ul style="list-style-type: none"> • Load bank testing simulates the electrical demands of one or more items of electrical equipment. The test monitors the generator to ensure that it is operating properly. 	See Appendix “Q” \$1,200
8	Seagrape LS # 24 (10) Generator Replacement	<ul style="list-style-type: none"> • Existing generator should be replaced in approximately ten (10) years. 	See Appendix “Q” \$52,000



+Project		Description of Work	Cost Development Details
9	Install New Manhole Cover Insert	<ul style="list-style-type: none"> LBTS started the installation of new cover inserts (inflow dish) for all existing manholes within the Town's owned and maintained sanitary sewer system in order to restrict the rate of inflow during rain events. Such installations were completed by January 2012. 	N/A
10	Gravity Sewer System Capacity Evaluation (Hydraulic Model)	<ul style="list-style-type: none"> Allows for proper sizing and confirmation of individual gravity sewer lines to accommodate future demand. Serves as a tool to estimate impact of planned developments to the sewer system. 	Based on engineering estimate. \$50,000
11	Suspect Lateral I/I Program (to be performed every 10 years)	This project does not include the CCTV inspection of lateral sections located within private property (private laterals). However, it is recommended to inspect private laterals by 2015. This is a more complicated operation since it may involve legal ramifications.	
11.1	Cleanout (CO) Installation (to be done in house)	<ul style="list-style-type: none"> Based on the findings during the CO Location (item 2 of Operating Budget Expenses), LBTS will install cleanout boxes and make repairs if defects are present. It is assumed that 30% of total laterals will require installation of a new CO. 	(1) $\$250/\text{CO} \times 1,100\text{CO}(\text{laterals}) \times 30\% = \$82,500$ (2) $\$82,500 \times 15\% \text{ Contingency} = \$12,400$ (3) $(1) + (2) = \$82,500 + \$12,400 = \$94,900$
11.2	Data Evaluation and Repair Recommendation (laterals only)	<ul style="list-style-type: none"> The Engineer will review the findings during the lateral CCTV inspections only and provide repair recommendations. 	Based on engineering estimate. \$12,800
11.3	Lateral Rehabilitation	<ul style="list-style-type: none"> The Contractor will repair defects as identified by the Engineer. 	TBD
11.4	Engineering / CM / Inspection for item 11.3	<ul style="list-style-type: none"> The Engineer will provide construction management and inspection services during the construction of the recommended repairs. 	TBD (20% of total cost from item 11.3)



+Project		Description of Work	Cost Development Details
11.5	Smoke Testing	<ul style="list-style-type: none"> The Contractor will perform smoke testing on the gravity sewer system in order to detect inflow sources within the public and private side and confirm success of repairs completed. To be executed once all lateral repairs have been completed (11.3) 	(1) $\$0.50/\text{ft} \times 50,000\text{ft} = \$25,000$ (2) $\$25,000 \times 15\% \text{ Contingency} = \$3,800$ (1) + (2) = $\$28,800 \times 1.03^2$ (3% inflation factor) = $\$30,600$
11.6	CM / Inspection for item 11.5	<ul style="list-style-type: none"> The Engineer will provide construction management and inspection services during the smoke testing activities. 	$\$30,600 \times 20\% = \$6,100$ Based on 20% of total cost from item 11.5
12	I/I Reduction Maintenance Program		
12.1	Data Evaluation / Repair Recommendation	<ul style="list-style-type: none"> The Engineer will review the findings during the mainline CCTV inspections and provide repair recommendations. 	Based on engineering estimate. $\$12,800 \times 1.03^2 = \$13,600$
12.2	Mainline Rehabilitation	<ul style="list-style-type: none"> The Contractor will repair defects as identified by the Engineer. 	TBD
12.3	Engineering / CM / Inspection for item 12.2	<ul style="list-style-type: none"> Engineer will prepare contract specifications and bidding services, provide construction management and inspection services during the construction of the recommended repairs. 	TBD (20% of total cost from item 12.2)



Table 18
List of Projects and Operating Budget Expenses Description

+Project		Description of Work	Cost Development Details
1	Lift Station (s) SCADA Monitoring Program	<ul style="list-style-type: none"> Monthly hydrograph updates allow for identification of maintenance issues within the gravity sewer system. Monitor progress with the I/I Reduction Maintenance Program. 	8hr/month x \$85/hr x 12month/yr = \$8,200
2	Lateral CCTV Inspection and Cleanout (CO) Location	<ul style="list-style-type: none"> The Contractor will: <ol style="list-style-type: none"> Perform CCTV inspections of lateral lines from the mainline in order to detect infiltration sources. Locate and mark existing cleanouts on the public side. 	(1) (Lateral CCTV Insp.) = $\$0.47/\text{ft} \times 1,100\text{lateral} \times 25\text{ft/lateral} = \$12,900$ (2) (Main Cleaning & CCTV Insp.) = $\$0.94/\text{ft} \times 50,000\text{ft} = \$47,000$ (3) [(1) + (2)] x 15% Contingency = $[\$12,900 + \$47,000] \times 15\% = \$9,000$ (1) + (2) + (3) = \$68,900
3	Mainline Cleaning and CCTV Inspection	<ul style="list-style-type: none"> A three year cycle is recommended. <ol style="list-style-type: none"> Cleaning: to be performed every year (2013, 2014, and 2015 - on). CCTV Inspection: to be performed year 3 only (2015, 2018, and 2021). The Contractor will clean and inspect via CCTV each line segment. The cleaning process will remove all grease, sand, silt, solids, roots, rags, debris, etc from each line segment. This operation has two important benefits (a) prevent backups or overflows in the sewer system (b) identify pipe structural deficiencies and construction features that will need rehabilitation. 	(1) (Cleaning) = $\$0.47/\text{ft} \times 50,000\text{ft} = \$23,500$ (2) $\$23,000 \times 15\% \text{ Contingency} = \$3,500$ (3) (1) + (2) = $\$23,500 + \$3,500 = \$27,000$ (4) (CCTV Insp.) = $\$0.47/\text{ft} \times 50,000\text{ft} = \$23,500$ (5) $\$23,500 \times 15\% \text{ Contingency} = \$3,500$ (6) (4) + (5) = $\$23,500 + \$3,500 = \$27,000$ (7) (3) + (6) = $\$27,000 + \$27,000 = \$54,000 \times 1.03^2 \text{ (3\% inflation factor)} = \$57,300$



Appendix "A"
Project Location Map
Total Pages 1



PROJECT LOCATION MAP

PLAN
AERIAL VIEW



4501 OCEAN DRIVE
LAUDERDALE-BY-THE-SEA
FLORIDA 33308
954-776-0576
www.lauderdalebythesea-fl.gov



8390 NW 53rd Street, Suite 200
Doral, Florida 33166
Phone: 305-392-9979
Fax: 305-392-9912
www.Kingengineering.com
Engineering License #2610

JOB NO.
4777-000-001
DATE:
DEC. 2011

APPENDIX
A



Appendix "B"
Atlas Correction Form
Total Pages 1

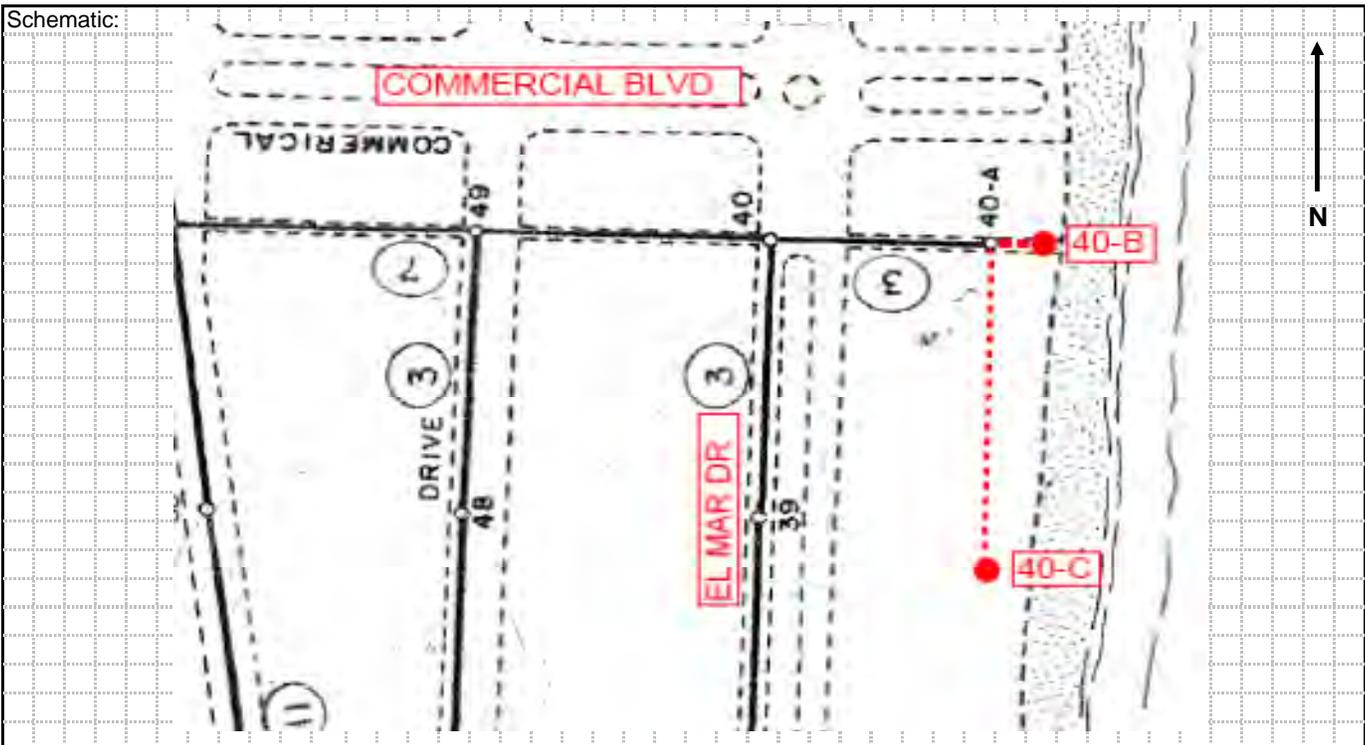


Atlas Correction Form

LS: Seagrape (LS 24) Originator: King Engineering Associates Inc.

Date: 10/31/2011

Comments: _____



Segments to Add:						Segments to Remove:		Comments:
UMH	DMH	Length (ft)	Depth (ft)	Dia. (in)	Pipe Material	Upstream MH	Downstr MH	
40C	40A	362	5	8	PVC			
40B	40A	25	5	8	VCP			



Appendix "C"
Summary of Defects by Basin
Total Pages 1



Summary of Defects by Basin

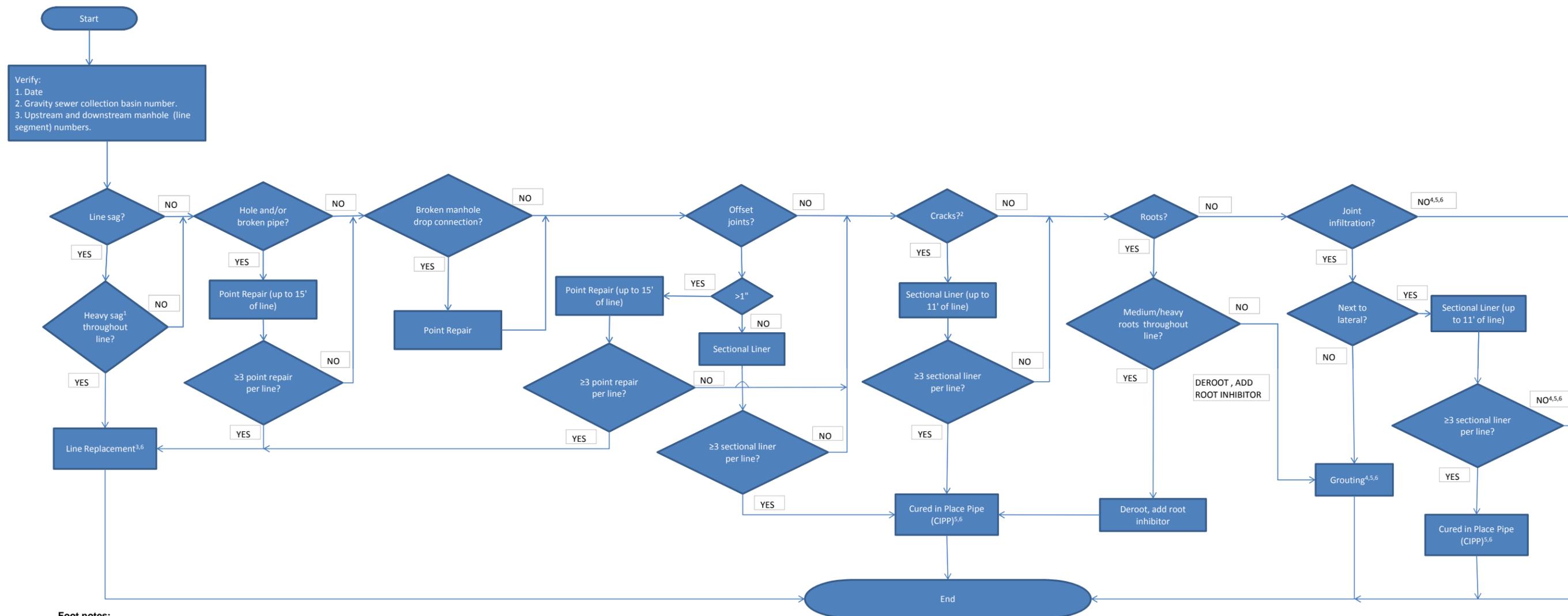
Basin No.	Definition	Count
Hibiscus (LS # 25 (2))	Longitudinal Crack	31
	Circular Crack	8
	Joint/Stains	7
	Multiple Cracks	5
	Joint/Infiltration	3
	Deposits	2
	Broken Pipe	2
	Heavy Roots	1
	Medium Roots	1
	Total	60
Seagrape (LS # 24 (10))	Longitudinal Crack	164
	Joint/Infiltration	141
	Joint/Stains	94
	Multiple Cracks	50
	Circular Crack	38
	Deposits	30
	Light Roots	29
	Medium Roots	15
	Broken Pipe	5
	Severe Offset	2
	Heavy Roots	2
	Joint/Separated	1
	Sag in Pipe	1
	Total	572
Total (Basin Hibiscus + Seagrape)		632



Appendix “D”
Repair Criteria and Technology Guidelines
Total Pages 1



Repair Criteria and Technology Guidelines Flow Chart



Foot notes:

1. Pipe is fully submerged due to sag.
2. Circular, longitudinal, multiple with active infiltration or stains.
3. Try not to use in rear easements, if lining is possible.
4. If cost of point repairs (grouting, de-rooting, sectional liner(s), and/or point repair(s)) is 80% or more of full length repair (CIPP or line replacement), then assign full length repair.
5. Investigate lateral. If CIPP was assigned, repair damaged lateral connections prior to issuance.
 - a. If lateral is leaking through annular space, then "grout lateral annular space" is assigned.
 - b. If hammer taps are present, then "robotics" is assigned.
 - c. If cracks and/or medium to heavy roots are present in lateral, then "point repair lateral" is assigned.
 - d. If lateral is identified as "suspect lateral", then "investigate suspect lateral" is assigned.
6. Check that video footage equals TV log footage.

General notes:

1. Clean and de-grease pipe, if required.
2. Descale pipe, if required.



Appendix "E"

*Repair Recommendations by Line Segment
(Sorted from the Highest (5) to the Lowest (0) NASSCO Score)*

Total Pages 14



**Repair Recommendations by Line Segment
(Sorted from the Highest (5) to the Lowest (0) NASSCO Score)**

Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
24(10)	109		113		5846	N/A	Cured-in-Place Liner	Multiple Cracks and Leaking Joint	4	\$6,100.00
24(10)	12		13		5844	N/A	Cured-in-Place Liner	Longitudinal Cracks and Leaking Joint	10.5	\$5,960.00
						58.9	T-Liner / Top Hat	Leaking Joint	0.3	\$3,500.00
						186.1	T-Liner / Top Hat	Leaking Joint	0.2	\$3,500.00
24(10)	105		109		5744	N/A	Cured-in-Place Liner	Multiple Cracks	5	\$6,100.00
24(10)	115		116		5543	N/A	Cured-in-Place Liner	Longitudinal Cracks	1.5	\$5,960.00
						259.1	T-Liner / Top Hat	Longitudinal crack	0.5	\$3,500.00
						271.5	T-Liner / Top Hat	Circular Cracks	0	\$3,500.00
24(10)	96		99		5542	N/A	Cured-in-Place Liner	Multiple Cracks	2	\$5,580.00
24(10)	64		82		5442	N/A	Cured-in-Place Liner	Longitudinal Cracks and Leaking Joint	1	\$5,800.00
						18.9	T-Liner / Top Hat	Circular Crack	3	\$3,500.00
						187.8	T-Liner / Top Hat	Multiple Cracks	2	\$3,500.00
						245.5	T-Liner / Top Hat	Multiple Cracks	2	\$3,500.00
24(10)	91		92		5442	N/A	Cured-in-Place Liner	Multiple Cracks	0.5	\$7,660.00
24(10)	10		11		5347	N/A	Cured-in-Place Liner	Leaking Joint and Multiple Cracks	4	\$7,660.00
						266.3	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
						316.2	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
24(10)	46		47		5345	N/A	Cured-in-Place Liner	Multiple Cracks and Leaking Joint	1.5	\$7,500.00
						56.7	T-Liner / Top Hat	Leaking Joint	0.1	\$3,500.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
						164.1	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
						219	T-Liner / Top Hat	Leaking Joint	1	\$3,500.00
24(10)	40		49		5247	N/A	Cured-in-Place Liner	Multiple Cracks	1	\$6,600.00
24(10)	6		7		5245	N/A	Cured-in-Place Liner	Multiple Cracks and Leaking Joint	1.5	\$8,500.00
						121.7	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
24(10)	11		12		5245	N/A	Cured-in-Place Liner	Multiple Cracks and Leaking Joint	2.5	\$6,100.00
						65.7	T-Liner / Top Hat	Leaking Joint	0.2	\$3,500.00
						104.7	T-Liner / Top Hat	Leaking Joint	0.1	\$3,500.00
						175.7	T-Liner / Top Hat	Leaking Joint	0.1	\$3,500.00
24(10)	102		105		5245	N/A	Cured-in-Place Liner	Longitudinal Cracks and Leaking Joint	2.5	\$6,100.00
24(10)	113		117		5245	N/A	Cured-in-Place Liner	Longitudinal Cracks and Leaking Joint	1.5	\$6,100.00
24(10)	79		80		5243	N/A	Cured-in-Place Liner	Multiple Cracks	0	\$2,600.00
						5	T-Liner / Top Hat	Broken Pipe	0	\$3,500.00
						39.8	T-Liner / Top Hat	Broken Pipe	0.2	\$3,500.00
						86.9	T-Liner / Top Hat	Multiple Cracks	0.5	\$3,500.00
24(10)	101		102		5243	N/A	Cured-in-Place Liner	Multiple Cracks and Leaking Joints	1.5	\$7,980.00
25(2)	133		134		5242	12.5	Sectional Liner	Longitudinal Crack	0	\$850.00
						55.3	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
						65.4	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						293.1	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
						328	Sectional Liner	Longitudinal Crack	0.2	\$850.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
24(10)	17		25		5242	N/A	Cured-in-Place Liner	Longitudinal Cracks and Leaking Joints	1	\$6,790.00
24(10)	122	A	123		5242	N/A	Cured-in-Place Liner	Longitudinal Cracks	2	\$1,780.00
25(2)	135		136		5241	82.9	T-Liner / Top Hat	Circular Crack	0.5	\$3,500.00
						99.7	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						135.2	T-Liner / Top Hat	Longitudinal Crack	0.2	\$3,500.00
						182.2	T-Liner / Top Hat	Circular Crack	0.1	\$3,500.00
24(10)	8		17		5241	N/A	Cured-in-Place Liner	Multiple Cracks	1.5	\$6,500.00
24(10)	43		44		5241	61	Sectional Liner	Longitudinal Crack	0	\$850.00
						97.3	Investigate Suspect Lateral	100% Blocked w/ Debris	0	\$150.00
						119.9	Investigate Suspect Lateral	50% Blocked w/ Debris	0	\$150.00
						159.8	Excavated Point Repair Lateral (Public Property)	Broken Pipe	0	\$3,700.00
						160	Excavated Point Repair Main Line (2)	Heavy Sag up to 185'	0	\$7,000.00
24(10)	47		48		5241	N/A	Clean, Test, Seal Main Line	Leaking Joints	1	\$4,000.00
						105.8	T-Liner / Top Hat	Leaking Joint	0.4	\$3,500.00
						166.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						218.2	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	99		102		5241	N/A	Cured-in-Place Liner	Multiple Cracks and Leaking Joints	2.5	\$6,100.00
24(10)	107		108		5232	136.5	Sectional Liner	Longitudinal Crack	0.5	\$850.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
						136.1	T-Liner / Top Hat	Leaking Joint	1.5	\$3,500.00
						150	T-Liner / Top Hat	Circular Crack	0.1	\$3,500.00
						263.9	Sectional Liner	Circular Crack	0.1	\$850.00
25(2)	132				5231	23	Sectional Liner	Longitudinal Crack	0	\$850.00
						232	T-Liner / Top Hat	Deroot Lateral prior CIP	1	\$3,500.00
						352.5	T-Liner / Top Hat	Deroot Lateral prior CIP	1	\$3,500.00
24(10)	1				5222	N/A	Clean, Test, Seal Main Line	Joint/Stains/Fine Roots. Add Root Inhibitor	0	\$4,200.00
						140.7	Excavated Point Repair Lateral (Public Property)	Offset Joint > 1" (Soil Visible)	8	\$3,700.00
24(10)	16				5200	168.9	Sectional Liner	Longitudinal Crack	0.4	\$850.00
						243.5	Sectional Liner	Multiple Cracks	0.4	\$850.00
24(10)	39				5200	N/A	Clean, Test, Seal Main Line	Leaking Joint	1	\$3000.00
						66.2	T-Liner / Top Hat	Multiple Cracks	1	\$3,500.00
24(10)	40	C	40		5200	50.9	Investigate Suspect Lateral	Heavy and Clear Flow	4	\$150.00
						141.8	Investigate Suspect Lateral	Heavy and Clear Flow	6	\$150.00
24(10)	116				5200	201	T-Liner / Top Hat	Leaking Joint	1	\$3,500.00
						283.3	Sectional Liner	Multiple Cracks	0.2	\$850.00
24(10)	49				5146	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.5	\$3,700.00
						13	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	118				5146	N/A	Cured-in-Place Liner	Joint/Stains and Multiple Cracks	2	\$7,300.00



Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
24(10)	104			105	5144	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.4	\$4,000.00
						65.2	T-Liner / Top Hat	Leaking Joint	0.2	\$3,500.00
						157.1	T-Liner / Top Hat	Longitudinal Crack	0.1	\$3,500.00
						174.4	T-Liner / Top Hat	Leaking Joint	0.3	\$3,500.00
						221	T-Liner / Top Hat	Leaking Joint	0.1	\$3,500.00
						223.1	T-Liner / Top Hat	Leaking Joint	0.2	\$3,500.00
						297.6	T-Liner / Top Hat	Circular Crack	0.2	\$3,500.00
						309.4	T-Liner / Top Hat	Longitudinal Crack	0.1	\$3,500.00
25(2)	134			135	5143	139.7	T-Liner / Top Hat	Longitudinal Crack	1	\$3,500.00
						146.8	T-Liner / Top Hat	Heavy Roots (100% Blocked)	0	\$3,500.00
						188.2	Sectional Liner	Multiple Cracks	0.2	\$850.00
24(10)	55			83	5143	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$4,400.00
24(10)	45			46	5142	105.2	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						192.4	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						331	Repair Leaks in Manhole Channel	Circular Crack in MH Channel	1	\$300.00
24(10)	48			49	5142	N/A	Clean, Test, Seal Main Line	Leaking Joints	0.4	\$4,000.00
						122	T-Liner / Top Hat	Circular Crack	0.5	\$3,500.00
24(10)	96			95	5142	2.6	Sectional Liner	Circular Crack	0.1	\$850.00
						71.6	Sectional Liner	Longitudinal Cracks	0.1	\$850.00
						133.1	T-Liner / Top Hat	Leaking Joint	2	\$3,500.00
24(10)	103			104	5142	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.5	\$4,200.00
						57.2	T-Liner / Top Hat	Leaking Joint	1	\$3,500.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
						214.4	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	112		113		5142	N/A	Cured-in-Place Liner	Leaking Joints and Longitudinal Crack	1.2	\$5,600.00
25(2)	136		137		5141	N/A	Cured-in-Place Liner	Broken Section and Multiple Cracks	2.5	\$5,400.00
						3.5	T-Liner / Top Hat	Multiple Cracks	0.2	\$3,500.00
						174.6	T-Liner / Top Hat	Circular Crack	0.2	\$3,500.00
						211.9	T-Liner / Top Hat	Longitudinal Crack	0.2	\$3,500.00
						219	T-Liner / Top Hat	Longitudinal Crack	0.2	\$3,500.00
						220.3	T-Liner / Top Hat	Deposits	0.1	\$3,500.00
24(10)	87		89		5141	131.3	Excavated Point Repair Main Line	Severe Offset Joint and Leaking Joint	1	\$4,000.00
24(10)	13		15		5135	N/A	Clean, Test, Seal Main Line	Leaking Joint	1.2	\$2,960.00
24(10)	7		8		5132	N/A	Clean, Test, Seal Main Line	Leaking Joint	2	\$3,850.00
						28	Sectional Liner	Circular Crack	0	\$850.00
						92	Sectional Liner	Longitudinal Crack	0	\$850.00
24(10)	22		23		5132	N/A	Clean, Test, Seal Main Line	Leaking Joint	1	\$3,370.00
24(10)	36		37		5131	48.4	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24(10)	81		82		5131	58.1	T-Liner / Top Hat	Leaking Joint	3	\$3,500.00
						167.3	T-Liner / Top Hat	Circular Crack	0.2	\$3,500.00
						219.4	T-Liner / Top Hat	Leaking Joint	0.2	\$3,500.00
24(10)	20		21		5122	N/A	Clean, Test, Seal Main Line	Leaking Joint	2	\$3,290.00
24(10)	80		81		5122	20.2	Sectional Liner	Longitudinal Crack and Joint/Stains	0	\$850.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
						248.6	Sectional Liner	Multiple Cracks	0	\$850.00
						248.6	T-Liner	Multiple Cracks	1	\$3,500.00
24(10)	93		96		5121	108.5	Sectional Liner	Separated Joint	0.2	\$850.00
						219.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	32		33		5115	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$3,750.00
						375.9	T-Liner / Top Hat	Deroot Lateral prior CIP (Heavy Roots)	0	\$3,500.00
25(2)	141		142		5100	158.6	Excavated Point Repair Main Line	Broken Pipe	0	\$4,000.00
24(10)	38		39		5100	264.2	Sectional Liner	Broken Pipe	0	\$850.00
						264.2	T-Liner / Top Hat	Broken Pipe	0	\$3,500.00
24(10)	40	A	40		5100	100.6	Investigate Suspect Lateral	Lateral blocked 100%		\$150.00
24(10)	108		109		5100	91.5	T-Liner / Top Hat	Circular Crack	0.4	\$3,500.00
24(10)	123		125		5100	8.7	Sectional Liner	Longitudinal Crack	2.5	\$850.00
24(10)	129		83		5100	N/A	Clean, Test, Seal Main Line	Leaking Joint	1	\$1,840.00
24(10)	24		25		4621	N/A	Cured-in-Place Liner	Multiple Cracks and Leaking Joints	0.4	\$6,600.00
24(10)	53		54		4518	N/A	Clean, Test, Seal Main Line	Leaking Joints	0.4	\$3,140.00
						54.4	T-Liner / Top Hat	Cracked Joint	0.1	\$3,500.00
24(10)	78		80		4300	116.8	T-Liner / Top Hat	Cracked Joint	0.1	\$3,500.00
						192.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	119		119	A	4300	N/A	Cured-in-Place Liner	Longitudinal Cracks	1	\$4,100.00
24(10)	127	A	127		4300	143.9	Sectional Liner	Cracked Joint	0.2	\$850.00



Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
						164	Sectional Liner	Multiple Cracks up to the end of Pipe	0.5	\$850.00
						164.4	T-Liner / Top Hat	Multiple Cracks	0.1	\$3,500.00
24(10)	69		80		4234	N/A	Cured-in-Place Liner	Multiple Cracks	1	\$5,740.00
						105.6	T-Liner / Top Hat	Circular Crack	0.5	\$3,500.00
						108.5	T-Liner / Top Hat	Longitudinal Crack	0.2	\$3,500.00
24(10)	93		92		4232	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$3,790.00
24(10)	106		107		4212	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$3,000.00
24(10)	60		62		4200	10.4	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
						102.6	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24(10)	60		59		4137	N/A	Clean, Test, Seal Main Line	Add Root Inhibitor	0	\$2,800.00
						N/A	Deroot Main Line	Light to Medium Roots	0	\$300.00
25(2)	141		137		4133	37	Sectional Liner	Multiple Cracks	0.1	\$850.00
						53.9	Sectional Liner	Longitudinal Crack	0.2	\$850.00
						99	Sectional Liner	Multiple Cracks	0.1	\$850.00
						99	T-Liner / Top Hat	Multiple and Circular Cracks	0.1	\$3,500.00
24(10)	126		127	A	4132	N/A	Clean, Test, Seal Main Line	Leaking Joints	0.4	\$1,740.00
						15	Sectional Liner	Multiple Cracks	0.1	\$850.00
						15	T-Liner / Top Hat	Multiple Cracks	0.1	\$3,500.00
24(10)	127		128		4132	N/A	Clean, Test, Seal Main Line	Leaking Joints	1	\$3,700.00
24(10)	127	B	127	A	4132	N/A	Clean, Test, Seal Main Line	Leaking Joints	0.4	\$1,040.00
					4132	91.5	Sectional Liner	Longitudinal Crack	0.1	\$850.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
25(2)	153		154		4131	N/A	Cured-in-Place Liner	Cracked Joint and Multiple Cracks	0.2	\$1,988.00
24(10)	15		16		4131	253.5	Sectional Liner	Longitudinal Crack	0.2	\$850.00
						373.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	50		51		4131	279	Sectional Liner	Multiple Cracks	0	\$850.00
						384	Sectional Liner	Longitudinal Crack	0	\$850.00
24(10)	68		67		4131	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.1	\$1,120.00
						84.8	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	82		83		4131	90.1	Sectional Liner	Longitudinal Cracks	0.1	\$850.00
24(10)	100		101		4131	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.3	\$4,000.00
						247.4	Sectional Liner	Longitudinal Crack	0	\$850.00
						395.7	Sectional Liner	Circular Crack	0	\$850.00
24(10)	33		55		4123	34.5	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
						N/A	Clean, Test, Seal Main Line	Leaking Joint. Add Root Inhibitor	0.1	\$2,000.00
						N/A	Deroot Main Line	Light Roots		\$300.00
24(10)	41		42		4121	N/A	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor	0	\$5,500.00
						87.1	Sectional Liner	Longitudinal Crack	0	\$850.00
						423	Sectional Liner	Circular Crack	0	\$850.00
24(10)	85		86		4121	4	Sectional Liner	Multiple Cracks	1	\$850.00
						394.3	Sectional Liner	Circular Crack	0	\$850.00
24(10)	111		112		4121	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.1	\$2,700.00
						269	Sectional Liner	Longitudinal Crack	0.1	\$850.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
24(10)	52		53		411A	N/A	Clean, Test, Seal Main Line	Leaking Joint. Add Root Inhibitor	0.1	\$4,200.00
24(10)	5		6		4112	154.3	T-Liner / Top Hat	Longitudinal Crack	0.1	\$3,500.00
24(10)	68		69		4112	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,860.00
						174.2	T-Liner / Top Hat	Deroot Lateral prior CIP	0.4	\$3,500.00
24(10)	14		15		4100	176.1	Sectional Liner	Longitudinal Crack up to Drop Connection	0	\$850.00
24(10)	56		58		4100	10.8	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24(10)	98		97		4100	27	T-Liner / Top Hat	Circular Crack	0.2	\$3,500.00
24(10)	110		111		4100	233.9	T-Liner / Top Hat	Circular Crack	0.1	\$3,500.00
25(2)	143		144		3700	N/A	Cured-in-Place Liner	Multiple Cracks	1	\$7,420.00
25(2)	154	A	154		3422	N/A	Cured-in-Place Liner	Multiple Cracks	0.1	\$5,720.00
24(10)	30		31		3314	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$3,800.00
						281	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						299	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						379.2	Sectional Liner	Circular Crack	0.1	\$850.00
24(10)	44		45		3300	107	Sectional Liner	Longitudinal Crack	0	\$850.00
						152.2	Sectional Liner	Longitudinal Crack	0	\$850.00
						204.8	Sectional Liner	Longitudinal Crack	0	\$850.00
24(10)	19		20		3222	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$3,640.00
						200	Sectional Liner	Longitudinal Crack	0	\$850.00
						361	Sectional Liner	Circular Crack	0	\$850.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
24(10)	4		5		3221	N/A	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor	0	\$3,940.00
						260.8	T-Liner / Top Hat	Deroot Lateral prior CIP	0.1	\$3,500.00
						299.4	Sectional Liner	Circular Crack	0	\$850.00
24(10)	31		32		3221	N/A	Clean, Test, Seal Main Line	Leaking Joints	0.1	\$3,800.00
						222.5	Sectional Liner	Longitudinal Crack	0.1	\$850.00
						250	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	70		71		3221	N/A	Cured-in-Place Liner	Joint/Stains and Longitudinal Cracks	0	\$5,660.00
24(10)	72		75		321A	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,640.00
24(10)	65		66		3212	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$3,890.00
						4.6	T-Liner / Top Hat	Circular Crack	0.1	\$3,500.00
25(2)	144		145		3200	360	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	8	A	8		3200	36.8	Sectional Liner	Multiple Cracks	0	\$850.00
						134.8	Sectional Liner	Multiple Cracks	0	\$850.00
24(10)	18		19		3200	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.1	\$3,640.00
						362	Sectional Liner	Circular Crack	0	\$850.00
25(2)	152		153		3123	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$3,570.00
						352.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	73		74		3123	N/A	Cured-in-Place Liner	Joint/Stains and Longitudinal Cracks	0	\$5,380.00
25(2)	140		141		3121	68.3	T-Liner / Top Hat	Circular Crack	0.1	\$3,500.00
						121	Sectional Liner	Longitudinal Crack	0	\$850.00
						306.3	Sectional Liner	Longitudinal Crack	0	\$850.00



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Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
25(2)	151		149		3121	262.4	Sectional Liner	Leaking Joint and Circular Crack	0.1	\$850.00
24(10)	128		129		3121	63.1	Sectional Liner	Longitudinal Cracks	0.2	\$850.00
25(2)	151		150		3114	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$2,600.00
						1.5	Sectional Liner	Circular Crack	0.1	\$850.00
25(2)	139		138		3111	2	Sectional Liner	Circular Crack	0.1	\$850.00
24(10)	66		66	A	3111	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$1,580.00
						26.8	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24(10)	2		3		3100	141.3	T-Liner / Top Hat	Cracked Joint	0	\$3,500.00
24(10)	40	B	40	A	3100	3.8	Investigate Suspect Lateral	Deposits	0	\$150.00
24(10)	58		60		3100	148.9	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24(10)	62		64		3100	222.8	T-Liner / Top Hat	Circular Crack	0	\$3,500.00
24(10)	66	A	68		3100	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.1	\$2,280.00
24(10)	98		99		3100	50	Investigate Suspect Lateral	Deposits		\$150.00
24(10)	120		121		3100	N/A	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$3,360.00
24(10)	122		122	A	3100	59.6	Sectional Liner	Longitudinal crack	0.1	\$850.00
25(2)	139		140		2211	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$3,000.00
						298	Sectional Liner	Longitudinal Crack	0	\$850.00
24(10)	71		72		211C	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,870.00
						135	Sectional Liner	Longitudinal Crack	0	\$850.00
25 (2)	147		148		2100	48	Sectional Liner	Longitudinal Crack	0	\$850.00



Lauderdale-By-The-Sea
Sanitary Sewer Capital Improvements Plan

Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
24(10)	27		28		2100	283.2	Sectional Liner	Longitudinal Crack	0	\$850.00
24(10)	76		77		1600	N/A	Cured-in-Place Liner	Joint/stains and cracks	0	\$4,740.00
24(10)	114		115		1600	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,970.00
24(10)	77		78		1500	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,200.00
24(10)	34		35		1400	N/A	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor.	0	\$3,100.00
24(10)	74		75		1400	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,430.00
24(10)	28		29		1200	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$1,760.00
24(10)	75		78		1200	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,690.00
24(10)	51		52		1100	300.8	Sectional Liner	Longitudinal Crack	0	\$850.00
24(10)	119	A	120		1100	N/A	Clean, Test, Seal Main Line	Joint/Stains	0	\$1,325.00
25(2)	130		131		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	131		132		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	142		145		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	145		LS		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	146		147		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	148		153		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	151		152		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	154		LS		0000	N/A	No Repair	N/A	0	\$0.00
25(2)	154	B	154	A	0000	N/A	No Repair	N/A	0	\$0.00
25(2)	154	C	154	B	0000	N/A	No Repair	N/A	0	\$0.00
24(10)	3		4		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	9		10		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	21		22		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	23		24		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	25		33		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	26		27		0000	N/A	No Repair	N/A	0	\$0.00



Lauderdale-By-The-Sea
Sanitary Sewer Capital Improvements Plan

Basin No.	UMH		DMH		NASSCO Score	Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)**
						Distance***	Type*	Remarks		
24(10)	28	A	28		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	29		30		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	35		36		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	37		38		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	43		42		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	54		55		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	58		57		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	61		62		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	64		63		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	84		85		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	86		87		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	90		89		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	93		90		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	94		95		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	117		128		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	121		122		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	124		125		0000	N/A	No Repair	N/A	0	\$0.00
24(10)	125		126		0000	N/A	No Repair	N/A	0	\$0.00
Total									136.4	\$703,353
Contingency (15%)										\$105,502
Grand Total (Rounded)										\$808,900

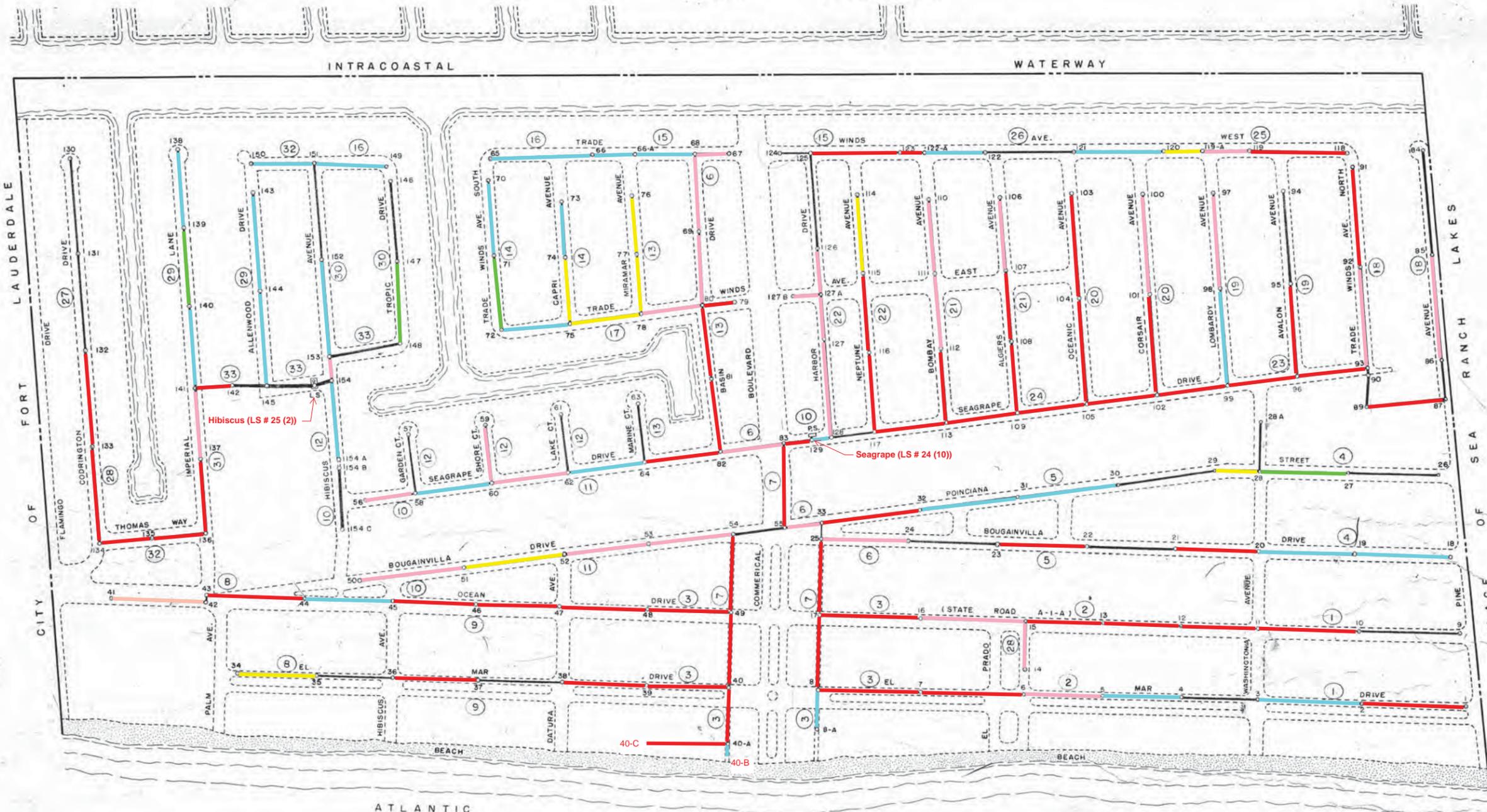
*If only one joint was leaking or showed sign of infiltration, then Clean, Test, and Seal Mainline (Grouting) was recommended for the entire line segment.

** The cost estimating methodology used is consistent with the preliminary level of analysis in the report and is only intended for planning purposes. A more detailed cost estimate should be prepared during the design phase when materials and quantities can be estimated more accurately. Also, please note there is significant uncertainty in estimating future construction costs due to the present volatile economic environment.

*** Distance is measured from UMH.



Appendix “F”
NASSCO Score Map
Total Pages 1



Legend

LEGEND

- SANITARY SEWERS AND MANHOLE
- 14" F.M. NEW FORCE MAIN
- EXISTING TELEPHONE
- EXISTING WATER
- EXISTING GAS MAIN
- EXISTING STORM SEWERS AND MANHOLE TO REMAIN
- NEW STORM SEWER AND MANHOLE
- C.B. EXISTING CATCH BASIN TO REMAIN
- C.B. NEW CATCH BASIN
- SHEET CONTINUATION NUMBER
- EXISTING BURIED POWER CABLE
- F.H. FIRE HYDRANT

NASSCO Rating Score	Line Segments
No defect	(34)
1st Character = 1	(9)
1st Character = 2	(4)
1st Character = 3	(29)
1st Character = 4	(31)
1st Character = 5	(58)
Total	165

LOCATION PLAN

GENERAL NOTES

1. ELEVATIONS REFER TO U.S.C. & G.S. (MEAN SEA LEVEL) DATUM.
2. LOCATION OF SEWER LATERALS B CONNECTING WYES IS SUBJECT TO ORDERS OF THE ENGINEER. AT TIME OF CONSTRUCTION AND ARE SUBJECT TO REDLOCATION THROUGHOUT THE WIDTH OR LENGTH OF ANY LOT OR PARCEL OF LAND. LATERALS AND WYES WILL BE LOCATED TO SERVE PLUMBING OF EXISTING BUILDINGS IN THE MOST ECONOMICAL MANNER, IN THE OPINION OF THE ENGINEER, WITH DUE CONSIDERATION OF EXISTING UTILITIES, STREET PAVING, DRIVEWAYS AND PLANTINGS.
3. STORM DRAIN SIZES, LOCATIONS AND ELEVATIONS ARE APPROXIMATE AND BASED ON AVAILABLE INFORMATION.
4. LOCATION OF UNDERGROUND UTILITIES IS APPROXIMATE AND THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES TO LOCATE THEIR EXISTING UNDERGROUND UTILITIES BEFORE STARTING JOB.
5. MANHOLES TO BE LOCATED IN CROWN OF ROAD, UNLESS OTHERWISE INDICATED.
6. BENCH MARKS AND PROFILE ELEVATIONS FURNISHED BY MCLAUGHLIN ENGINEERING CO. TOPOGRAPHY BY BOSWORTH AERIAL SURVEYS, INC.
7. ALL SEWER PIPE TO BE VITRIFIED CLAY PIPE, UNLESS OTHERWISE NOTED.

REV. NO.	DATE	DRWN	CHKD	REMARKS
0	8/68	J.V.V.		

SANITARY SEWERS

TOWN OF
LAUDERDALE-BY-THE-SEA
BROWARD COUNTY, FLORIDA

GENERAL PLAN

PHILPOTT, ROSS & SAARINEN, INC.
ENGINEERS
FORT LAUDERDALE, FLA.

DATE 8-7-68	AS - BUILT	SHEET A _{RO}
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Appendix "G"
Sanitary Sewer Capital Improvements Plan (SSCIP)
Total Pages 1



Capital Budget Plan - Project Schedule

Project	Projections										Total per Project
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	
1 Gravity Sewer Rehabilitation Program											
1.1 Gravity Sewer System Rehabilitation - NASSCO Ranking 5	\$ 500,900.00										\$ 500,900.00
1.2 Gravity Sewer System Rehabilitation - NASSCO Ranking 4		\$ 151,700.00									\$ 151,700.00
1.3 Gravity Sewer System Rehabilitation - NASSCO Ranking 3		\$ 120,400.00									\$ 120,400.00
1.4 Gravity Sewer System Rehabilitation - NASSCO Ranking 2		\$ 10,700.00									\$ 10,700.00
1.5 Gravity Sewer System Rehabilitation - NASSCO Ranking 1		\$ 25,400.00									\$ 25,400.00
1.6 Engineering / CM / Inspection from item 1 above	\$ 75,100.00	\$ 46,200.00									\$ 121,300.00
2 Hibiscus LS # 25 (2) - Minor Repairs	\$ 500.00		\$ 6,300.00								\$ 6,800.00
3 Seagrape LS # 24 (10) - Minor Repairs	\$ 1,000.00		\$ 12,000.00								\$ 13,000.00
4 Hibiscus LS # 25 (2) - Full Upgrade									\$ 268,000.00		\$ 268,000.00
5 Seagrape LS # 24 (10) - Full Upgrade									\$ 783,000.00		\$ 783,000.00
6 Seagrape LS # 24 (10) - Flow Meter Replacement									\$ 15,700.00		\$ 15,700.00
7 Seagrape LS # 24 (10) - Generator Load Bank Test	\$ 1,200.00										\$ 1,200.00
8 Seagrape LS # 24 (10) - Generator Replacement									\$ 52,000.00		\$ 52,000.00
9 Install New Manhole Cover Insert (Completed on January 2012)											\$ -
10 Gravity Sewer System Capacity Evaluation (Model)	\$ 50,000.00										\$ 50,000.00
11 Suspect Lateral I/I Program (to be performed every 10 years)											
11.1 Cleanout Installation	\$ 94,900.00										\$ 94,900.00
11.2 Data Evaluation and Repair Recommendation	\$ 12,800.00										\$ 12,800.00
11.3 Lateral Rehabilitation		TBD									TBD
11.4 Engineering / CM / Inspection for item 11.3		TBD									TBD
11.5 Smoke Testing			\$ 30,600.00								\$ 30,600.00
11.6 CM / Inspection for item 11.5			\$ 6,100.00								\$ 6,100.00
12 I/I Reduction Maintenance Program											
12.1 Data Evaluation / Repair Recommendation				\$ 13,600.00			\$ 14,900.00			\$ 16,200.00	\$ 44,700.00
12.2 Mainline Rehabilitation					TBD			TBD			TBD
12.3 Engineering / CM / Inspection for item 12.2					TBD			TBD			TBD
Total per Year	\$ 736,400.00	\$ 354,400.00	\$ 55,000.00	\$ 13,600.00	\$ -	\$ -	\$ 14,900.00	\$ -	\$ -	\$ 1,134,900.00	Total
											\$ 2,309,200.00

Operating Budget Expenses - Project Schedule

Project	Projections										Total per Project
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	
1 Lift Station SCADA Monitoring Program	\$ 8,200.00	\$ 8,400.00	\$ 8,700.00	\$ 9,000.00	\$ 9,300.00	\$ 9,600.00	\$ 9,900.00	\$ 10,200.00	\$ 10,500.00	\$ 10,800.00	\$ 94,600.00
2 Lateral CCTV Inspection and Cleanout Location (ongoing)	\$ 68,900.00										\$ 68,900.00
3 Mainline Cleaning and CCTV Inspection		\$ 27,000.00	\$ 27,800.00	\$ 57,300.00	\$ 29,500.00	\$ 30,400.00	\$ 62,600.00	\$ 32,200.00	\$ 33,200.00	\$ 68,400.00	\$ 368,400.00
Total per Year	\$ 77,100.00	\$ 35,400.00	\$ 36,500.00	\$ 66,300.00	\$ 38,800.00	\$ 40,000.00	\$ 72,500.00	\$ 42,400.00	\$ 43,700.00	\$ 79,200.00	Total
											\$ 531,900.00

All costs include a 15% Contingency

All future costs are adjusted for a 3% annual inflation factor



Appendix "H"

Summary of Bid Costs
Total Pages 2



Summary of Bid Costs

Line Replacement ¹	Size (in)	\$/LF 0-9 ft depth	\$/LF 9-18 ft depth
	8	\$ 34.50	\$ 65.00
	10	\$ 58.00	\$ 84.00
	12	\$ 58.00	\$ 84.00
	15	\$ 58.00	\$ 84.00
	18	\$ 58.00	\$ 84.00
	24	\$ 58.00	\$ 84.00

Sectional Liner	Size (in)	\$/Each 8 ft Length	\$/LF Additional length
	8	\$ 850.00	\$ 1.00
	10	\$ 800.00	\$ 1.00
	12	\$ 900.00	N/A
	15	\$ 1,250.00	N/A
	18	\$ 2,000.00	N/A
	24	\$ 3,000.00	N/A

Cured in Place Liners (CIP)	Size (in)	\$/LF
	8	\$ 20.00
	10	\$ 23.00
	12	\$ 24.00
	15	\$ 30.00
	18	\$ 40.00
	24	\$ 60.00

Grouting	Size (in)	\$/LF
	8	\$ 10.00
	10	\$ 10.00
	12	\$ 12.20
	15	\$ 12.20
	18	\$ 15.30
	24	\$ 15.30



Point Repair²	\$/Each (All Sizes)
	\$ 3,700.00

Top Hat	\$/Each (All Sizes)
	\$ 3,500.00 - \$ 4,000.00

T-Liner	\$/Each (All Sizes)
	\$ 3,500.00 - \$ 4,500.00

¹ Cost from table + \$600.00 (for manhole reconnection) x 2 + [(\$22.00 x line length) if paved] + (\$560.00 x number of laterals and drop connection)

² Cost from table + \$400.00 if paved



Appendix "I"

Planning Level Opinion of Probable Construction Cost
Total Pages 12



Planning Level Opinion of Probable Construction Cost

Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
25 (2)	133		134		12.5	Sectional Liner	Longitudinal Crack	0	\$850.00
25 (2)	133		134		65.4	Sectional Liner	Longitudinal Crack	0.1	\$850.00
25 (2)	133		134		328	Sectional Liner	Longitudinal Crack	0.2	\$850.00
25 (2)	135		136		99.7	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	43		44		61	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	47		48		166.9	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	47		48		218.2	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	107		108		136.5	Sectional Liner	Longitudinal Crack	0.5	\$850.00
24 (10)	107		108		263.9	Sectional Liner	Circular Crack	0.1	\$850.00
25 (2)	132		133		23	Sectional Liner	Cracked Joint	0	\$850.00
24 (10)	16		17		168.9	Sectional Liner	Longitudinal Crack	0.4	\$850.00
24 (10)	16		17		243.5	Sectional Liner	Multiple Cracks	0.4	\$850.00
24 (10)	116		117		283.3	Sectional Liner	Multiple Cracks	0.2	\$850.00
24 (10)	49		54		13	Sectional Liner	Longitudinal Crack	0.1	\$850.00
25 (2)	134		135		188.2	Sectional Liner	Multiple Cracks	0.2	\$850.00
24 (10)	45		46		105.2	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	45		46		192.4	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	96		95		2.6	Sectional Liner	Circular Crack	0.1	\$850.00
24 (10)	96		95		71.6	Sectional Liner	Longitudinal cracks @ 66.8' & 71.6	0.1	\$850.00
24 (10)	103		104		214.4	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	7		8		28	Sectional Liner	Circular Crack	0	\$850.00
24 (10)	7		8		92	Sectional Liner	Longitudinal Crack	0	\$850.00
24 (10)	80		81		20.2	Sectional Liner	Cracked Joint and Stains	0	\$850.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	80		81		248.6	Sectional Liner	Multiple Cracks	0	\$850.00
24 (10)	93		96		108.5	Sectional Liner	Separated Joint	0.2	\$850.00
24 (10)	93		96		219.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	38		39		264.2	Sectional Liner	Broken Pipe	0	\$850.00
24 (10)	123		125		8.7	Sectional Liner	Longitudinal Crack	2.5	\$850.00
24 (10)	78		80		192.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	127	A	127		143.9	Sectional Liner	Cracked Joint	0.2	\$850.00
24 (10)	127	A	127		164	Sectional Liner	Multiple cracks up to end of pipe	0.5	\$850.00
25 (2)	141		137		37	Sectional Liner	Multiple Cracks starting at 32.5'	0.1	\$850.00
25 (2)	141		137		53.9	Sectional Liner	Longitudinal Crack	0.2	\$850.00
25 (2)	141		137		99	Sectional Liner	Multiple and circular cracks	0.1	\$850.00
24 (10)	126		127	A	15	Sectional Liner	Multiple cracks	0.1	\$850.00
24 (10)	127	B	127	A	91.5	Sectional Liner	Cracked joint	0.1	\$850.00
24 (10)	15		16		253.5	Sectional Liner	Longitudinal crack	0.2	\$850.00
24 (10)	15		16		373.9	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	50		51		279	Sectional Liner	Multiple cracks	0	\$850.00
24 (10)	50		51		384	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	68		67		84.8	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	82		83		90.1	Sectional Liner	Longitudinal cracks	0.1	\$850.00
24 (10)	100		101		247.4	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	100		101		395.7	Sectional Liner	Circular crack	0	\$850.00
24 (10)	41		42		87.1	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	41		42		423	Sectional Liner	Circular crack	0	\$850.00
24 (10)	85		86		4	Sectional Liner	Multiple cracks	1	\$850.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	85		86		394.3	Sectional Liner	Circular crack	0	\$850.00
24 (10)	111		112		269	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	14		15		176.1	Sectional Liner	Longitudinal crack up to drop connection	0	\$850.00
24 (10)	30		31		281	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	30		31		299	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	30		31		379.2	Sectional Liner	Circular crack	0.1	\$850.00
24 (10)	44		45		107	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	44		45		152.2	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	44		45		204.8	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	19		20		200	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	19		20		361	Sectional Liner	Circular crack	0	\$850.00
24 (10)	4		5		299.4	Sectional Liner	Circular crack	0	\$850.00
24 (10)	31		32		222.5	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	31		32		250	Sectional Liner	Longitudinal crack	0.1	\$850.00
25 (2)	144		145		360	Sectional Liner	Longitudinal Crack	0.1	\$850.00
24 (10)	8	A	8		36.8	Sectional Liner	Multiple cracks	0	\$850.00
24 (10)	8	A	8		134.8	Sectional Liner	Multiple cracks	0	\$850.00
24 (10)	18		19		362	Sectional Liner	Circular crack	0	\$850.00
25 (2)	152		153		352.9	Sectional Liner	Longitudinal Crack	0.1	\$850.00
25 (2)	140		141		121	Sectional Liner	Longitudinal Crack	0	\$850.00
25 (2)	140		141		306.3	Sectional Liner	Longitudinal Crack	0	\$850.00
25 (2)	151		149		262.4	Sectional Liner	Leaking Joint and Circular crack	0.1	\$850.00
24 (10)	128		129		63.1	Sectional Liner	Longitudinal cracks at 63.1' and 67.8'	0.2	\$850.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
25 (2)	151		150		1.5	Sectional Liner	Circular Crack	0.1	\$850.00
25 (2)	139		138		2	Sectional Liner	Circular Crack	0.1	\$850.00
24 (10)	66		66	A	26.8	Sectional Liner	Longitudinal crack	0.1	\$850.00
24 (10)	122		122	A	59.6	Sectional Liner	Longitudinal crack	0.1	\$850.00
25 (2)	139		140		298	Sectional Liner	Longitudinal Crack	0	\$850.00
24 (10)	71		72		135	Sectional Liner	Longitudinal crack	0	\$850.00
25 (2)	147		148		48	Sectional Liner	Longitudinal Crack	0	\$850.00
24 (10)	27		28		283.2	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	51		52		300.8	Sectional Liner	Longitudinal crack	0	\$850.00
24 (10)	45		46		331	Repair Leaks in Manhole Channel	Circular crack in MH channel	1	\$300.00
24 (10)	43		44		160	Excavated Point Repair Main Line (2)	Heavy sag up to 185'	0	\$7,000.00
24 (10)	87		89		131.3	Excavated Point Repair Main Line	Offset Joint and Leaking Joint	1	\$4,000.00
25 (2)	141		142		158.6	Excavated Point Repair Main Line	Broken Pipe	0	\$4,000.00
24 (10)	60		59		N/A*	Deroot Main Line	Light to medium roots	0	\$300.00
24 (10)	33		55		N/A*	Deroot Main Line	Light roots		\$300.00
24 (10)	109		113		N/A*	Cured-in-Place Liner	Multiple cracks and leaking joint	4	\$6,100.00
24 (10)	12		13		N/A*	Cured-in-Place Liner	Leaking joints and longitudinal crack	10.5	\$5,960.00
24 (10)	105		109		N/A*	Cured-in-Place Liner	Multiple cracks	5	\$6,100.00
24 (10)	115		116		N/A*	Cured-in-Place Liner	Longitudinal cracks	1.5	\$5,960.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	96		99		N/A*	Cured-in-Place Liner	Multiple cracks	2	\$5,580.00
24 (10)	64		82		N/A*	Cured-in-Place Liner	Longitudinal cracks and leaking joints	1	\$5,800.00
24 (10)	91		92		N/A*	Cured-in-Place Liner	Multiple cracks	0.5	\$7,660.00
24 (10)	10		11		N/A*	Cured-in-Place Liner	Leaking joints and multiple cracks	4	\$7,660.00
24 (10)	46		47		N/A*	Cured-in-Place Liner	Leaking joints and multiple cracks	1.5	\$7,500.00
24 (10)	40		49		N/A*	Cured-in-Place Liner	Multiple cracks	1	\$6,600.00
24 (10)	6		7		N/A*	Cured-in-Place Liner	Leaking joints and multiple cracks	1.5	\$8,500.00
24 (10)	11		12		N/A*	Cured-in-Place Liner	Leaking joints and multiple cracks	2.5	\$6,100.00
24 (10)	102		105		N/A*	Cured-in-Place Liner	Longitudinal cracks and leaking joints	2.5	\$6,100.00
24 (10)	113		117		N/A*	Cured-in-Place Liner	Longitudinal cracks and leaking joints	1.5	\$6,100.00
24 (10)	79		80		N/A*	Cured-in-Place Liner	Multiple cracks	0	\$2,600.00
24 (10)	101		102		N/A*	Cured-in-Place Liner	Leaking joints and multiple cracks	1.5	\$7,980.00
24 (10)	17		25		N/A*	Cured-in-Place Liner	Leaking joints and longitudinal cracks	1	\$6,790.00
24 (10)	122	A	123		N/A*	Cured-in-Place Liner	Longitudinal cracks	2	\$1,780.00
24 (10)	8		17		N/A*	Cured-in-Place Liner	Multiple cracks	1.5	\$6,500.00
24 (10)	99		102		N/A*	Cured-in-Place Liner	Multiple cracks and leaking joints	2.5	\$6,100.00
24 (10)	118		119		N/A*	Cured-in-Place Liner	Joint/Stains and multiple cracks	2	\$7,300.00
24 (10)	112		113		N/A*	Cured-in-Place Liner	Leaking joints and longitudinal cracks	1.2	\$5,600.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
25 (2)	136		137		N/A*	Cured-in-Place Liner	Broken Section and Multiple Cracks	2.5	\$5,400.00
24 (10)	24		25		N/A*	Cured-in-Place Liner	Leaking joints and multiple cracks	0.4	\$6,600.00
24 (10)	119		119	A	N/A*	Cured-in-Place Liner	Longitudinal cracks	1	\$4,100.00
24 (10)	69		80		N/A*	Cured-in-Place Liner	Multiple cracks	1	\$5,740.00
25 (2)	153		154		N/A*	Cured-in-Place Liner	Cracked Joint and Multiple Cracks	0.2	\$1,988.00
25 (2)	143		144		N/A*	Cured-in-Place Liner	Multiple Cracks	1	\$7,420.00
25 (2)	154	A	154		N/A*	Cured-in-Place Liner	Multiple cracks	0.1	\$5,720.00
24 (10)	70		71		N/A*	Cured-in-Place Liner	Joint/Stains and longitudinal cracks	0	\$5,660.00
24 (10)	73		74		N/A*	Cured-in-Place Liner	Joint/Stains and longitudinal cracks	0	\$5,380.00
24 (10)	76		77		N/A*	Cured-in-Place Liner	Joint/stains and cracks	0	\$4,740.00
24 (10)	47		48		N/A*	Clean, Test, Seal Main Line	Leaking joints	1	\$4,000.00
24 (10)	1		2		N/A*	Clean, Test, Seal Main Line	Joint/Stains. Add root inhibitor	0	\$4,200.00
24 (10)	39		40		N/A*	Clean, Test, Seal Main Line	Leaking joint	1	\$3,000.00
24 (10)	49		54		N/A*	Clean, Test, Seal Main Line	Leaking joint	0.5	\$3,700.00
24 (10)	104		105		N/A*	Clean, Test, Seal Main Line	Leaking joints	0.4	\$4,000.00
24 (10)	55		83		N/A*	Clean, Test, Seal Main Line	Leaking joint	0.2	\$4,400.00
24 (10)	48		49		N/A*	Clean, Test, Seal Main Line	Leaking joints	0.4	\$4,000.00
24 (10)	103		104		N/A*	Clean, Test, Seal Main Line	Leaking joint	0.5	\$4,200.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	13		15		N/A*	Clean, Test, Seal Main Line	Leaking joints	1.2	\$2,960.00
24 (10)	7		8		N/A*	Clean, Test, Seal Main Line	Leaking joint	2	\$3,850.00
24 (10)	22		23		N/A*	Clean, Test, Seal Main Line	Leaking joint	1	\$3,370.00
24 (10)	20		21		N/A*	Clean, Test, Seal Main Line	Leaking joint	2	\$3,290.00
24 (10)	32		33		N/A*	Clean, Test, Seal Main Line	Joint/stains	0	\$3,750.00
24 (10)	129		83		N/A*	Clean, Test, Seal Main Line	Leaking joint	1	\$1,840.00
24 (10)	53		54		N/A*	Clean, Test, Seal Main Line	Leaking joints	0.4	\$3,140.00
24 (10)	93		92		N/A*	Clean, Test, Seal Main Line	Leaking joint	0.2	\$3,790.00
24 (10)	106		107		N/A*	Clean, Test, Seal Main Line	Leaking joints	0.2	\$3,000.00
24 (10)	60		59		N/A*	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor	0	\$2,800.00
24 (10)	126		127	A	N/A*	Clean, Test, Seal Main Line	Leaking joints	0.4	\$1,740.00
24 (10)	127		128		N/A*	Clean, Test, Seal Main Line	Leaking joints	1	\$3,700.00
24 (10)	127	B	127	A	N/A*	Clean, Test, Seal Main Line	Leaking joints	0.4	\$1,040.00
24 (10)	68		67		N/A*	Clean, Test, Seal Main Line	Leaking joint	0.1	\$1,120.00
24 (10)	100		101		N/A*	Clean, Test, Seal Main Line	Leaking joint	0.3	\$4,000.00
24 (10)	33		55		N/A*	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor	0.1	\$2,000.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	41		42		N/A*	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor	0	\$5,500.00
24 (10)	111		112		N/A*	Clean, Test, Seal Main Line	Leaking Joint	0.1	\$2,700.00
24 (10)	52		53		N/A*	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor	0.1	\$4,200.00
24 (10)	68		69		N/A*	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,860.00
24 (10)	30		31		N/A*	Clean, Test, Seal Main Line	Joint/Stains	0	\$3,800.00
24 (10)	19		20		N/A*	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$3,640.00
24 (10)	4		5		N/A*	Clean, Test, Seal Main Line	Joint/Fine Roots. Add Root Inhibitor	0	\$3,940.00
24 (10)	31		32		N/A*	Clean, Test, Seal Main Line	Leaking Joint	0.1	\$3,800.00
24 (10)	72		75		N/A*	Clean, Test, Seal Main Line	Joint/Stains	0	\$2,640.00
24 (10)	65		66		N/A*	Clean, Test, Seal Main Line	Leaking Joint	0.2	\$3,890.00
Total (Gravity Sewer Main)								84.7	\$425,403.00
24 (10)	12		13		58.9	T-Liner / Top Hat	Leaking Joint	0.3	\$3,500.00
24 (10)	12		13		186.1	T-Liner / Top Hat	Leaking Joint	0.2	\$3,500.00
24 (10)	115		116		259.1	T-Liner / Top Hat	Longitudinal Crack	0.5	\$3,500.00
24 (10)	115		116		271.5	T-Liner / Top Hat	Circular Crack	0	\$3,500.00
24 (10)	64		82		18.9	T-Liner / Top Hat	Circular Crack	3	\$3,500.00
24 (10)	64		82		187.8	T-Liner / Top Hat	Multiple cracks	2	\$3,500.00
24 (10)	64		82		245.5	T-Liner / Top Hat	Multiple cracks	2	\$3,500.00
24 (10)	10		11		266.3	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
24 (10)	10		11		316.2	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00



Lauderdale-By-The-Sea
Sanitary Sewer Capital Improvements Plan

Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	46		47		56.7	T-Liner / Top Hat	Leaking Joint	0.1	\$3,500.00
24 (10)	46		47		164.1	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
24 (10)	46		47		219	T-Liner / Top Hat	Leaking Joint	1	\$3,500.00
24 (10)	6		7		121.7	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
24 (10)	11		12		65.7	T-Liner / Top Hat	Leaking Joint	0.2	\$3,500.00
24 (10)	11		12		104.7	T-Liner / Top Hat	Leaking Joint	0.1	\$3,500.00
24 (10)	11		12		175.7	T-Liner / Top Hat	Leaking Joint	0.1	\$3,500.00
24 (10)	79		80		5	T-Liner / Top Hat	Broken pipe	0	\$3,500.00
24 (10)	79		80		39.8	T-Liner / Top Hat	Broken pipe	0.2	\$3,500.00
24 (10)	79		80		86.9	T-Liner / Top Hat	Multiple cracks	0.5	\$3,500.00
25 (2)	133		134		55.3	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
25 (2)	133		134		293.1	T-Liner / Top Hat	Leaking Joint	0.5	\$3,500.00
25 (2)	135		136		82.9	T-Liner / Top Hat	Circular Crack	0.5	\$3,500.00
25 (2)	135		136		135.2	T-Liner / Top Hat	Longitudinal Crack	0.2	\$3,500.00
25 (2)	135		136		182.2	T-Liner / Top Hat	Circular Crack	0.1	\$3,500.00
24 (10)	47		48		105.8	T-Liner / Top Hat	Leaking joint	0.4	\$3,500.00
24 (10)	107		108		136.1	T-Liner / Top Hat	Leaking joint	1.5	\$3,500.00
24 (10)	107		108		150	T-Liner / Top Hat	Circular crack	0.1	\$3,500.00
25 (2)	132		133		232	T-Liner / Top Hat	Deroot Lateral prior CIP	1	\$3,500.00
25 (2)	132		133		352.5	T-Liner / Top Hat	Deroot Lateral prior CIP	1	\$3,500.00
24 (10)	39		40		66.2	T-Liner / Top Hat	Multiple crack	1	\$3,500.00
24 (10)	116		117		201	T-Liner / Top Hat	Leaking joint	1	\$3,500.00
24 (10)	104		105		65.2	T-Liner / Top Hat	Leaking joint	0.2	\$3,500.00
24 (10)	104		105		157.1	T-Liner / Top Hat	Longitudinal crack	0.1	\$3,500.00



Lauderdale-By-The-Sea
Sanitary Sewer Capital Improvements Plan

Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	104		105		174.4	T-Liner / Top Hat	Leaking joint	0.3	\$3,500.00
24 (10)	104		105		221	T-Liner / Top Hat	Leaking joint	0.1	\$3,500.00
24 (10)	104		105		223.1	T-Liner / Top Hat	Leaking joint	0.2	\$3,500.00
24 (10)	104		105		297.6	T-Liner / Top Hat	Circular crack	0.2	\$3,500.00
24 (10)	104		105		309.4	T-Liner / Top Hat	Longitudinal crack	0.1	\$3,500.00
25 (2)	134		135		139.7	T-Liner / Top Hat	Longitudinal Crack	1	\$3,500.00
25 (2)	134		135		146.8	T-Liner / Top Hat	Heavy Roots (100% Blocked)	0	\$3,500.00
24 (10)	48		49		122	T-Liner / Top Hat	Circular crack	0.5	\$3,500.00
24 (10)	96		95		133.1	T-Liner / Top Hat	Leaking joint	2	\$3,500.00
24 (10)	103		104		57.2	T-Liner / Top Hat	Leaking joint	1	\$3,500.00
25 (2)	136		137		3.5	T-Liner / Top Hat	Multiple cracks	0.2	\$3,500.00
25 (2)	136		137		174.6	T-Liner / Top Hat	Circular crack	0.2	\$3,500.00
25 (2)	136		137		211.9	T-Liner / Top Hat	Longitudinal crack	0.2	\$3,500.00
25 (2)	136		137		219	T-Liner / Top Hat	Longitudinal crack	0.2	\$3,500.00
25 (2)	136		137		220.3	T-Liner / Top Hat	Deposits	0.1	\$3,500.00
24 (10)	36		37		48.4	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24 (10)	81		82		58.1	T-Liner / Top Hat	Leaking joint	3	\$3,500.00
24 (10)	81		82		167.3	T-Liner / Top Hat	Circular crack	0.2	\$3,500.00
24 (10)	81		82		219.4	T-Liner / Top Hat	Leaking joint	0.2	\$3,500.00
24 (10)	80		81		248.6	T-Liner / Top Hat	Multiple cracks	1	\$3,500.00
24 (10)	32		33		375.9	T-Liner / Top Hat	Deroot Lateral prior CIP (Heavy roots)	0	\$3,500.00
24 (10)	38		39		264.2	T-Liner / Top Hat	Broken pipe	0	\$3,500.00
24 (10)	108		109		91.5	T-Liner / Top Hat	Circular crack	0.4	\$3,500.00
24 (10)	78		80		54.4	T-Liner / Top Hat	Cracked joint	0.1	\$3,500.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	78		80		116.8	T-Liner / Top Hat	Cracked joint	0.1	\$3,500.00
24 (10)	127	A	127		164.4	T-Liner / Top Hat	Multiple cracks	0.1	\$3,500.00
24 (10)	69		80		105.6	T-Liner / Top Hat	Circular crack	0.5	\$3,500.00
24 (10)	69		80		108.5	T-Liner / Top Hat	Longitudinal crack	0.2	\$3,500.00
24 (10)	60		62		10.4	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24 (10)	60		62		102.6	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
25 (2)	141		137		99	T-Liner / Top Hat	Multiple and circular cracks	0.1	\$3,500.00
24 (10)	126		127	A	15	T-Liner / Top Hat	Multiple cracks	0.1	\$3,500.00
24 (10)	33		55		34.5	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24 (10)	5		6		154.3	T-Liner / Top Hat	Longitudinal crack	0.1	\$3,500.00
24 (10)	68		69		174.2	T-Liner / Top Hat	Deroot Lateral prior CIP	0.4	\$3,500.00
24 (10)	56		58		10.8	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24 (10)	98		97		27	T-Liner / Top Hat	Circular crack	0.2	\$3,500.00
24 (10)	110		111		233.9	T-Liner / Top Hat	Circular crack	0.1	\$3,500.00
24 (10)	4		5		260.8	T-Liner / Top Hat	Deroot Lateral prior CIP	0.1	\$3,500.00
24 (10)	65		66		4.6	T-Liner / Top Hat	Circular crack	0.1	\$3,500.00
25 (2)	140		141		68.3	T-Liner / Top Hat	Circular Crack	0.1	\$3,500.00
24 (10)	2		3		141.3	T-Liner / Top Hat	Cracked joint	0	\$3,500.00
24 (10)	58		60		148.9	T-Liner / Top Hat	Deroot Lateral prior CIP	0	\$3,500.00
24 (10)	62		64		222.8	T-Liner / Top Hat	Circular crack	0	\$3,500.00
24 (10)	43		44		159.8	Excavated Point Repair Lateral (Public Property)	Broken pipe	0	\$3,700.00



Basin No.	UMH		DMH		Repair			Estimated I/I Rate (gpm)	Estimated Average Cost (\$)
					Distance**	Type	Remarks		
24 (10)	1		2		140.7	Excavated Point Repair Lateral (Public Property)	Offset joint > 1" (soil visible)	8	\$3,700.00
24 (10)	43		44		97.3	Investigate Suspect Lateral	100% blocked w/ debris	0	\$150.00
24 (10)	43		44		119.9	Investigate Suspect Lateral	50% blocked w/ debris	0	\$150.00
24 (10)	40	C	40	A	50.9	Investigate Suspect Lateral	Heavy and clear flow	4	\$150.00
24 (10)	40	C	40	A	141.8	Investigate Suspect Lateral	Heavy and clear flow	6	\$150.00
24 (10)	40	A	40		100.6	Investigate Suspect Lateral	Lateral blocked 100%	0	\$150.00
24 (10)	40	B	40	A	3.8	Investigate Suspect Lateral	Deposits	0	\$150.00
24 (10)	98		99		50	Investigate Suspect Lateral	Deposits	0	\$150.00
Total (Sewer Laterals)								51.7	\$277,950.00
Total (Gravity Sewer Main + Sewer Laterals)								136.4	\$703,353.00
Contingency (15%)									\$105,502.95
Grand Total (Rounded)									\$808,900.00

*N/A indicates a repair that needs to be applied to the entire line segment.

** Distance is measured from UMH.



Appendix “J”
Wastewater Service Agreement
Total Pages 45

CITY OF POMPANO BEACH
Broward County, Florida

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF POMPANO BEACH, FLORIDA, APPROVING AND AUTHORIZING THE PROPER CITY OFFICIALS TO EXECUTE A WASTEWATER SERVICE AGREEMENT BETWEEN THE CITY OF POMPANO BEACH AND THE TOWN OF LAUDERDALE-BY-THE-SEA; PROVIDING AN EFFECTIVE DATE.

BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF POMPANO BEACH, FLORIDA:

SECTION 1. That a Wastewater Service Agreement between the City of Pompano Beach and the Town of Lauderdale-By-The-Sea, a copy of which Agreement is attached hereto and incorporated by reference as if set forth in full, is hereby approved.

SECTION 2. That the proper City officials are hereby authorized to execute said Agreement between the City of Pompano Beach and the Town of Lauderdale-By-The-Sea.

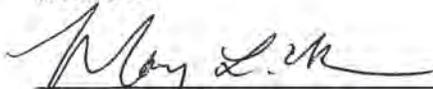
SECTION 3. This Resolution shall become effective upon passage.

PASSED AND ADOPTED this 11th day of December, 2007.



LAMAR FISHER, MAYOR

ATTEST:



MARY L. CHAMBERS, CITY CLERK

GBL/jrm
11/19/07
l:reso/2008-51

WASTEWATER SERVICE AGREEMENT

THIS AGREEMENT, made and entered into this 13th day of November 2007, by and between the CITY OF POMPANO BEACH, Florida, a municipal corporation of the State of Florida, hereinafter called "City" and the TOWN OF LAUDERDALE-BY-THE-SEA, a municipal corporation of the State of Florida, hereinafter referred to as the "Town";

WITNESSETH:

WHEREAS, the City and the Town previously entered into a 40 year Sewer Service Agreement dated July 14, 1966 through July 13, 2006, which supplied the Town with a method for disposing of sanitary wastewater collected through a wastewater disposal system, which included two Lift Stations; LS #12 (formerly #21) presently located at 251 N. Pompano Beach Boulevard, Pompano Beach and LS #24 (formerly LBTS Master) presently located at 4413 Seagrape Drive in Lauderdale-by-the-Sea; and

WHEREAS, the City furnished said wastewater collection and disposal system, including a capacity to accommodate the needs and requirements of the Town; and

WHEREAS, the City and the Town are desirous of continuing the agreement which has been extended by the City and Town to provide an adequate time period to enact a new, long-term agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained and by the parties hereto to be kept and performed, it is agreed as follows:

1. The City does hereby agree to allow the Town to remain connected by force main and other required appurtenances thereto, to Master Lift Station #12 and the Town agrees that during the term of this Agreement it shall use the City's sanitary wastewater facilities for the

disposal of all wastewater from the Town. Transmission and delivery of all of the City's wastewater, together with that of the Town, is to the Broward County Treatment Facility. Should said force main not contain sufficient capacity to accommodate future connections from potential customers in the Town, the Town shall be responsible for any and all costs to upgrade the force main.

2. Any facilities required to be constructed hereby by the Town, shall be subject to approval by the City's Engineer and Utilities Department and shall be subject to and in accord with the City's present and future ordinances, including City permits and inspection fees which the Town shall procure and pay for, and shall be in accord with usual City specifications. Said facilities shall be constructed only upon property dedicated to the public use; and in the event the City deems it necessary to acquire an easement or other interest in the property within which it is proposed to construct said facilities, such easement or other interest shall be acquired and paid for by the Town; and, further, if the same be located outside the present municipal limits of the Town, such easement or other interest in property shall be conveyed by Town to City by an appropriate instrument of conveyance. Town shall provide City with full and free access to the lift stations addressed in this Agreement to render services thereon, and will otherwise provide a safe workplace for City's employees to, from and within all lift stations.

3. The Town shall maintain adequate wastewater pumps, grinding equipment and chemical feeding equipment in the Town's Master Lift Station #24 to pump the wastewater into the treatment facilities of the City's Master Lift Station #12. All grinding, metering, chemical feeding and pumping equipment shall be maintained and kept operational so as to feed sufficient chemicals therein to reduce septicity in the wastewater reaching the Master Lift Station of the City to the standard required by the Utilities Department. No industrial wastes shall be put into the Town's collection system or the force main by either the Town or any use of the Town's

collection system, as defined in the City's Code of Ordinance and the Large User Agreement with Broward County. Personnel of the City shall be provided free access to the pumping station of the Town to determine that the requirements hereof are being met on a continuing basis.

4. The City shall establish rates to be charged to the Town by the City for the services provided. The methodology for these services are detailed on Schedule A, attached hereto. The Town shall be billed monthly, said bills shall be payable within fifteen (15) days of the date thereof. Adjustment to the above methodology will occur annually, as set forth in Chapter 50, "Water," of the City's Code of Ordinances.

5. In addition to an availability charge, the Town shall pay to the City a charge per thousand gallons based on the amount of sewage the Town delivers to the City's wastewater system, which charge shall include the Town's proportionate share of the operating and maintenance cost of the City's transmission facilities, a surcharge which shall represent payment in lieu of taxes to the City, and the cost of treatment of the Town's sewage, which cost shall be the same as that charged the City by Broward County. The charges per thousand gallons established shall apply from zero to 1.25 million gallons of wastewater per day. The charge shall be doubled for all wastewater in excess of 1.25 million gallons per day and shall be based on each single day's wastewater quantity. The maximum capacity required to be provided for hereunder by the City to the Town shall not exceed one million five hundred thousand gallons per day.

6. The term of this Agreement shall be fifteen (15) years, with option for renewal every five (5) years. The Renewal option is considered to be automatically in effect unless either party notifies the other in writing of their intention to not renew said Agreement, sixty (60) days prior to its expiration date.

7. The Town and each and every user of the collection system shall be subject to the same provision, penalties, rules and regulations as regular City users are, and the use thereof shall be subject to all applicable ordinances which now exist or which may subsequently be enacted, all such ordinances being incorporated herein by reference and made a part of this Agreement. Any violation of such provisions, rules, regulations or ordinance by the Town or any users of the Town's collection system as aforesaid shall constitute a breach of this Agreement and shall be grounds for cancellation of same by the City; provided, however, that the City shall notify the Town in writing of any such violation and the Town shall have thirty (30) days from the date of such notification to cease or cause to be ceased any such violation. The Town covenants and agrees that it will adopt its own rules, regulations and ordinances as the same may be required to insure the compliance with the provisions of this paragraph by the users of its collection system.

8. The Town agrees that for any construction required it will procure and pay for all necessary permits, inspection fees, and other costs normally and usually charge by the City, in addition to such similar costs and charges as may be required by Broward County. This also applies to renovation of existing structures or connections where the size of the domestic water connection increases by 1" or more, as this will place an added demand on the wastewater system. Regulations by Broward County or the Florida DEP, would supersede this sizing requirement.

9. The Town agrees that it will not connect nor allow any connection to any portion of its wastewater collection system constructed within its present municipal limits by any such properties, persons, buildings or structures outside of such municipal limits without prior permission and approval of the City and any revenue derived from any such connection shall

belong to and be the property of the City without any payment of any kind whatsoever to the Town.

10. Any temporary cessation of disposal of wastewater caused by an Act of God, fire, strike, casualty, necessary maintenance work, break-down of or injury to machinery, pumps or pipe, lines, civil or military authority, insurrection or riot, shall not constitute a breach of this Agreement on the part of the City and the City shall not be liable to the Town or its residents for any damage resulting from such cessation of disposal. In the event of a catastrophic event, City shall make every reasonable effort to keep Town on line. Town shall pay all related time and material expenses incurred as a result of this effort.

11. This Agreement shall be binding upon the successors and assigns of the parties hereto and may be enforced by an action in equity for specific performance of the terms and conditions hereof insofar as the same require the performance of acts other than the payment of money.

12. Any notice required to be given hereunder shall be considered to have been properly given if the same has been sent in writing, by certified or registered mail, to:

City Manager
City of Pompano Beach
Post Office Box 1300
Pompano Beach, FL 33061

Mayor/Town Manager
Town of Lauderdale-by-the-Sea
4501 Ocean Drive
Lauderdale-by-the-Sea, FL 33308

13. The Town agrees that upon the expiration of its present Agreement with the City of Fort Lauderdale it will purchase water from the City of Pompano Beach if it determines such purchase will be economically advantageous to it and if it determines the quality of the water offered by the City is equal to or better than the water provided by the City of Fort Lauderdale.

14. The Town agrees to indemnify, hold and save harmless the City from any judgments and costs and expenses to the City incurred by it in any litigation to which it may become a party, as either plaintiff or defendant, which said costs and expenses shall include reasonable attorneys' fees in both the trial court and any appellate court to which the matter may be appealed, resulting from the effects of the improper introduction by the Town or any users for the Town's collection system into the City's Wastewater collections system or any portion or part thereof of any solid liquid, gas or other effluent, which may cause damage either within or without the City's Wastewater collection system, and appurtenances thereto, including, but not limited, to fish kills, undesirable floating matter and explosions.

15. City shall furnish all maintenance labor, services, tools, and materials to regularly and systematically examine, clean, lubricate, adjust equipment and monitor telemetry data at the following two Lauderdale-by-the-Sea lift stations:

Lift Station #24 – presently located at Hibiscus Avenue/Commercial Blvd.

Lift Station #25 – presently located at Hibiscus Avenue/Allenwood Drive

City is responsible to make only those adjustments and repairs which are necessary due to ordinary wear and tear. City is not obligated to make adjustments, repairs or replacements necessitated by any other cause, including, but not limited to, accidents, vandalism or misuses of the equipment. Cost of this maintenance service is factored into Section 4. City specifically exempts from this service the calibration, repair and replacement of flow meters and SCADA system. City shall perform repairs on the two lift stations upon the Town's request. City will assume no responsibility for the expense and labor for repairs and replacement parts, electrical power, or for maintenance and repair of the two lift station structures. This work will be performed and billed on a time and materials basis and paid in accordance with the City ordinances. City will perform all maintenance work during regular work hours, 7:00 AM to 3:30

PM, on regular working days, Monday through Friday. Should the Town request examinations, cleaning, lubrication, adjustments, repairs replacements or emergency services at other times, the Town will compensate the City for any overtime expenses incurred. City will not be responsible for any loss, damage, detention or delay caused by labor disputes, fire, explosion, theft, earthquake, severe or unusual weather conditions, shortage of material, unavailability of material from usual sources, embargo, mischievous mischief, war, acts of God, wastewater spills or discharges resulting from infrastructures not associated with the two lift stations or any other cause beyond City's reasonable control and duties set forth herein. This Section of the Agreement may be terminated at any time without cause by either party, upon sixty (60) days written notice to the other party.

16. The City shall make staff available to the Town, whenever possible, to address wastewater emergencies. The Town recognizes that the City's first obligation is to serve the City's Utilities system. Staff will only be made available if the City system is not in distress. Such assistance will be provided under the general direction of the Town, who will have ultimate responsibility for utilities in the area. The City will be compensated for staff's actual expense for labor and benefits. Vehicles will be charged at the most recent FEMA rate. An additional 25% for services outside of City limits will be added. The total charge will be included in the Town's monthly invoice.

17. The parties shall defend and indemnify each other, to the extent allowed by law, and save each other harmless from and against any and all claims, suits, actions, damages and causes of action arising during the term of this Agreement caused by any action, neglect, erosion or mission of the other party relating to bodily injury, loss of life or damage to property sustained in, about, or upon the two lift stations or the improvements placed thereon, and to indemnify each other to the extent allowed by law, from claims resulting from any negligent acts of the

other party during the term of this Agreement, the parties further agree to indemnify and save each other harmless to the extent allowed by law, from and against all costs, attorney's fees, expenses and liabilities incurred in and about any such claim, investigation thereof, or the defense of any judgment or decrees, which may be entered therein as a result of the foregoing.

18. Any modification of the terms of this Agreement shall be in writing and upon approval of both Town and City utilizing the procedures necessary to authorize said modification pursuant to the requirements of each municipality, which shall be equal in dignity to the procedures utilized for approval of this Agreement.

IN WITNESS WHEREOF, the parties hereto have set their hands and affixed their corporate seals the day and year first above written.

"TOWN":

ATTEST:

TOWN OF LAUDERDALE-BY-THE-SEA

June White
Town Clerk

By: [Signature]
Mayor Oliver Parker

APPROVED as to form:

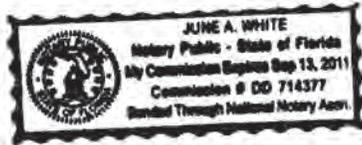
[Signature]
for JAMES A. CHEROF, Town Attorney

STATE OF FLORIDA
COUNTY OF BROWARD

The foregoing instrument was acknowledged before me this 13th day of November, 2007 by Oliver Parker, as Mayor of the Town of Lauderdale-By-The-Sea, Florida, a municipal corporation, on behalf of the municipal corporation, who is personally known to me.

NOTARY'S SEAL:

June A. White
NOTARY PUBLIC, STATE OF FLORIDA
JUNE A. WHITE
(Name of Acknowledger Typed, Printed or Stamped)
DD 714377
Commission Number



"CITY":

CITY OF POMPANO BEACH

Witnesses:

Carol Cantu
Signature of Witness

Carol Cantu
Print Name of Witness

Shelley R. Bartholomew
Signature of Witness

Shelley R. Bartholomew
Print Name of Witness

By: *Lamar Fisher*
Lamar Fisher, Mayor

By: *Keith Chadwell*
Keith Chadwell, City Manager

Attest:
Mary L. Chambers
Mary L. Chambers, City Clerk

(SEAL)

Approved As To Form By:

Gordon B. Linn
Gordon B. Linn, City Attorney

STATE OF FLORIDA
COUNTY OF BROWARD

The foregoing instrument was acknowledged before me this 17th day of December, 2007 by Lamar Fisher as Mayor of the City of Pompano Beach, Florida, a municipal corporation, on behalf of the municipal corporation, who is personally known to me.

NOTARY'S SEAL:

Asceletha Hammond
NOTARY PUBLIC, STATE OF FLORIDA

Asceletha Hammond

(Name of Acknowledger Typed, Printed or Stamped)

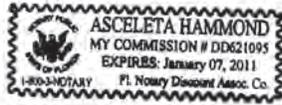
Commission Number



STATE OF FLORIDA
COUNTY OF BROWARD

The foregoing instrument was acknowledged before me this 17th day of December, 2007 by Keith Chadwell, as City Manager of the City of Pompano Beach, Florida, a municipal corporation, on behalf of the municipal corporation, who is personally known to me.

NOTARY'S SEAL:



Asceleta Hammond
NOTARY PUBLIC, STATE OF FLORIDA

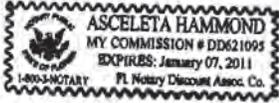
Asceleta Hammond
(Name of Acknowledger Typed, Printed or Stamped)

Commission Number

STATE OF FLORIDA
COUNTY OF BROWARD

The foregoing instrument was acknowledged before me this 17th day of December, 2007 by Mary L. Chambers as City Clerk of the City of Pompano Beach, Florida, a municipal corporation, on behalf of the municipal corporation, who is personally known to me.

NOTARY'S SEAL:



Asceleta Hammond
NOTARY PUBLIC, STATE OF FLORIDA

Asceleta Hammond
(Name of Acknowledger Typed, Printed or Stamped)

Commission Number

MEB/jrm
7/2/07 (2007-1584
l:agr/utility/wastewater service agreement

SCHEDULE A

The following terms used in this Schedule are defined as follows:

- Availability Charge – represents debt service costs for Lift Station #12 and the A1A Force Main allocated to LBS.
- Wastewater Treatment Charge – represents a) the volumetric rate charged by Broward County for wastewater treatment at the Regional Wastewater Treatment Plant; b) a Reserved Capacity Charge to recover debt service costs for the regional plant; and c) a Broward County True-Up Charge to make adjustments for the over- or under-recovery of cost paid to Broward County in the previous year.
- Lift Station #12 O&M Charge – represents costs associated with the operation and maintenance of Lift Station #12 (“LS12”), including electrical, chemical, pumping and general and administrative expenses incurred for the operation of LS12. This cost component also includes a 25% surcharge.
- True-Up Amount – represents an adjustment between the City and LBS calculated based on the actual revenues received from LBS compared to the actual costs incurred from the prior year.

SCHEDULE A

Calculation Methodology for LBS Wholesale Wastewater Treatment Rate

I.	Fixed Charge Components – Annual Cost	
	Availability Charge:	
	Lift Station #12 (1)	\$ 17,922.57
	AIA Force Main (2)	16,942.25
	Broward County Reserved Capacity Charge (3)	155,582.70
	Broward County True-Up Charge (prior year) (4)	
	LBS True-up from Prior Year (5)	<hr/>
	Subtotal: Fixed Annual Charge	\$
	CALCULATED MONTHLY CHARGE	
II.	Volumetric Charge Components – Annual Cost	
	Lift Station #12 Costs:	
	Electrical (6)	\$
	Chemical (7)	
	Personnel – WW Pumping (8)	
	Other WW Pumping (9)	
	Administrative/General Expense (10)	<hr/>
	Plus 25% Surcharge	<hr/>
	Subtotal: LS #12 Costs	\$
	Estimated Flow (based on 3 year average) (in kgal)	
	LS #12 Volumetric Rate (\$/kgal) (11)	\$
	Broward County Rate	\$
	Plus IR&R Charge	
	Subtotal: Broward County Rate (12)	<hr/>
	TOTAL VOLUMETRIC RATE (per 1,000 gal)	
	Total Annual Cost	\$
	Total Monthly Cost	\$
	Total Annual Cost converted to a Volumetric Rate	\$

SCHEDULE A

- (1) Calculated based on construction costs of \$964,820 amortized at approximately 4.11% over 20 years to generate annual payment amounts of \$71,690.28. Of this amount, 25% is allocated to LBS, per the contract, based on 1.5 MGD of capacity allocated to LBS out of a total capacity at the pump station of 6.0 MGD. The interest rate is consistent with the 1993 Bonds used to finance the project.
- (2) Calculated based on a total project cost of \$542,331, of which 50% is allocated to LBS per contract. The payment stream is based on an amortization of cost at 4.65% over 30 years.
- (3) This charge is based on the fixed charge for wastewater treatment debt service, including an IR&R factor (presently 2.5%), charged by Broward County. This charge is currently \$10,372.18 per month per MGD of reserved capacity. LBS is allocated 1.25 MGD of Pompano's available reserved capacity.
- (4) This is the amount of LBS's share of the true-up charge calculated by Broward County in each year. LBS's share is determined by multiplying the total true-up amount for Pompano Beach by the percentage determined by dividing LBS's metered flows by the total flows delivered by Pompano Beach to Broward County from 2 years prior. For FY 2007, the total true-up charge was \$5078.27, which was multiplied by 4.18% based on FY 2005 flows. It is not possible to forecast the magnitude of any true-up amounts in future years.
- (5) This is the amount determined by comparing actual revenues received from LBS with actual costs incurred for the prior year. The LBS true-up would only address costs recovered from the volumetric charge components for the LS#12 costs. It is not possible to forecast the magnitude of any true-up amounts in future years.
- (6) LBS's share of Electrical costs for LS#12 is calculated for each budget year by taking the budgeted amount for Total Pumping Electrical costs and multiplying by the percentage derived by dividing the most recent prior year's actual electrical costs for LS#12 by the actual Total Pumping Electrical costs for that year.
- (7) LBS's share of Chemical costs for LS#12 is calculated for each budget year by multiplying the budgeted amount for Total Chemical costs by LBS's share of total flows at LS#12 based on a three-year average of total flows and LBS flows.
- (8) LBS's share of Personnel Pumping costs for LS#12 is calculated for each budget year by multiplying the sum of the budgeted amounts for Pumping Personnel and Pumping Internal Services by the same percentage used for electrical costs.
- (9) LBS's share of Other Pumping costs for LS#12 is calculated for each budget year by multiplying the budgeted amounts for Other Pumping costs by the same flow based percentage factor used for chemical costs.
- (10) LBS's share of Administration and General Expenses for LS#12 is calculated for each budget year by multiplying the sum of the budgeted amounts for Sewer Administration and General Plant Expenses by three factors: (a) the ratio of pumping expenses to the sum of pumping expenses and transmission expenses; (b) the ratio of LS#12 flows to total flow delivered to Broward Co. for treatment; and by (c) the ratio of LBS flows to total LS#12 flows. The net effect of the three factors is a composite factor.
- (11) Calculated by dividing the subtotal for LS#12 costs, including a 25% surcharge, by the estimated flows for LBS based on the three-year average.
- (12) The Broward County Rate for wastewater treatment is treated as a pass-through cost to LBS based on the billable flows delivered and metered each month.

EXAMPLE: FOR COMPARISON PURPOSES ONLY – this page will not be included in the Agreement.

Calculated and Projected Wholesale Rate for Lauderdale-by-the-Sea Summary

	Notes	Fiscal Year		
		2007	2008	2009
I. Fixed Charge Components - Annual Cost				
Availability Charge				
Lift Station #12	(1)	\$ 17,922.57	\$ 17,922.57	\$ 17,922.57
A1A Force Main	(2)	16,942.25	16,942.25	16,942.25
Broward County Reserved Capacity Charge	(3)	155,582.70	155,582.70	155,582.70
Broward County True-Up Charge (prior year)	(4)	212.12	TBD	TBD
LBS True-up from Prior Year	(5)	12,783.31	TBD	TBD
Subtotal: Fixed Annual Charges		\$ 203,442.95	\$ 190,447.52	\$ 190,447.52
Calculated Monthly Charges		\$ 16,953.58	\$ 15,870.63	\$ 15,870.63

II. Volumetric Charge Components - Annual Cost				
Lift Station #12 Costs:				
LS#12 Electrical	(6)	\$ 13,241.29	\$ 14,416.46	\$ 14,921.03
LS#12 Chemical	(7)	40,893.06	44,522.31	46,080.59
LS#12 Personnel Pumping	(8)	41,461.85	45,458.10	47,381.35
LS#12 Other Pumping	(9)	7,270.92	7,777.45	8,049.86
LS#12 Admin. & General Expense	(10)	26,026.41	27,834.94	28,804.63
		\$ 128,893.54	\$ 140,009.26	\$ 145,237.26
Plus 25% Surcharge		32,223.38	35,002.31	36,309.32
Subtotal: LS# 12 Costs		\$ 161,116.92	\$ 175,011.57	\$ 181,546.58
Estimated Flow (based on 3-year average)	(in kgal)	220,444	207,811	207,811
LS#21 Volumetric Rate (\$/kgal)	(11)	\$ 0.731	\$ 0.842	\$ 0.874
Broward County Rate		\$ 0.689	\$ 0.689	\$ 0.689
Plus: IR&R Charge of 2.5%		\$ 0.017	\$ 0.017	\$ 0.017
Subtotal: Broward County Rate (\$/kgal)	(12)	\$ 0.706	\$ 0.706	\$ 0.706
Total Volumetric Rate per 1,000 gallons		\$ 1.437	\$ 1.548	\$ 1.580

Total Projected Annual Cost	\$ 520,242.93	\$ 512,220.41	\$ 518,755.42
Total Projected Monthly Cost	\$ 43,353.58	\$ 42,685.03	\$ 43,229.62
Total Annual Cost converted to a Volumetric Rate (For comparison purposes only.)	\$ 2.360	\$ 2.465	\$ 2.496



UTILITIES ADMINISTRATION

A. RANDOLPH BROWN
Director

1205 N.E. 5th Avenue
Pompano Beach, Florida 33060

Pompano Beach



2005

Phone: 954-545-7043

City of Pompano Beach, Florida

Fax: 954-545-7046

December 8, 2008

Ms. Kaola King, Finance Director
Town of Lauderdale by the Sea
4501 Ocean Drive
Lauderdale by the Sea, FL 33308

*copy John
✓
copy file /kk/ea*

SUBJECT: Wastewater Service Agreement

Dear Ms. King:

On December 11, 2007, the City of Pompano Beach adopted Resolution No. 2008-77 replacing our previous 40 year Wastewater Service Agreement with the Town of Lauderdale by the Sea, with a 15 year Agreement, with 5 year renewal options. In the interim, the Utilities Department has been working on an update of our entire Wastewater Ordinance, which included the new terms of our Wastewater Agreement. Our Wastewater Ordinance was adopted at the November 25, 2008 City Commission meeting.

We are now ready to implement the financial terms of the Wastewater Service Agreement. Enclosed for your review is a memo from Raftelis Financial Consultants Inc., outlining the calculation of our new Wastewater Service Agreement.

The new financial terms effected the prior years of FY2006, FY 2007 and FY 2008. The calculations show a true-up amount of \$47,232.01, \$46,134.77 and (\$32,094.65) respectively, for a total true-up credit of \$61,272.13 for Lauderdale by the Sea.

The credit amount has been taken into consideration, in calculating the FY2009 monthly rate of \$13,453.44, with volumetric component of \$1.596 per 1,000 gallons. The FY2009 monthly amount will be implemented to be effective with your January 1, 2009 billing. Going forward, we anticipate a recalculation of the monthly and volumetric rates on an annual basis.

Once you have had time to review the Raftelis memo, please let me know if you have any questions. I'd be glad to set up a phone conference with our consultant, if necessary, to review the calculations.

Sincerely,



A. Randolph Brown,
Utilities Director

C: Ms. Suzette Sibble, Finance Director
Mr. Kyle McPhail, Customer Service Manager
Ms. Phyllis Korab, Assistant City Manager



RAFTELIS FINANCIAL
CONSULTANTS, INC.

Date December 8, 2008

To: Randy Brown, Utilities Director, City of Pompano Beach
From: Lex Warmath, Vice President, Raftelis Financial Consultants, Inc.

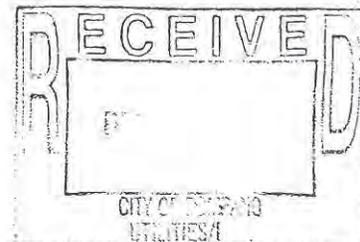
Re: FY 2009 Calculation of Wholesale Wastewater Treatment Rate for Lauderdale-by-the-Sea

It is our understanding that the City of Pompano Beach ("City") and the Town of Lauderdale-by-the-Sea ("LBS") have renegotiated and entered into a fifteen-year contract whereby the City will continue to provide wastewater transmission and treatment services to LBS, but using a revision to the methodology which is described below.

The Broward County Reserved Capacity Charge and the Broward County True-Up Charge will be recovered from a fixed monthly charge along with the Availability Charge. Similarly, the True-up Charge between LBS and the City will also be recovered as a fixed monthly charge, since this is a known amount that is independent of the actual volume used or delivered by LBS to the City. This will result in a larger fixed monthly charge component of the LBS rates and charges, but should reduce the level of under- or over-recovery of costs that may result when actual billed flows differ from the three-year average used to calculate the volumetric rate, and thereby reduce the level of the potential true-up amounts going forward.

The current rate charged to LBS is a monthly fixed component of \$2,905.40 and a volumetric component of \$2.216 per 1,000 gallons of usage. A true-up was calculated for FY 2006, FY 2007 and FY 2008 using the approach described above but has not been factored into a rate calculation. For both FY 2006 and FY 2007, the true-up calculation provides for a reimbursement to LBS of approximately \$47,200 and \$46,100, respectively. For FY 2008, the true-up calculation provides for a reimbursement from LBS to the City of approximately \$32,000. The net amount of these true-ups is a credit to LBS of approximately \$61,200.

In calculating the rate that should be charged for FY 2009, the net amount of the FY 2006, FY 2007 and FY 2008 true-up is applied. The resulting rate for FY 2009 that should be implemented immediately is a monthly fee of \$13,453.44 and a volumetric component of \$1.596 per 1,000 gallons. A summary of this calculation is provided below as well as a comparison of the rate calculation using both the previous and revised methodologies. As shown in the comparison, the calculated total volumetric rate for FY 2009 is basically equal to the rate currently assessed. However, as mentioned above, having a larger fixed monthly charge should reduce the level of future true-ups.



Calculated FY 2009 Rate

		Fiscal Year (1)
		2009
I. Fixed Charge Components - Annual Cost		
Availability Charge:		
Lift Station #12	\$	17,922.57
A1A Force Main		16,942.25
Broward County Reserved Capacity Charge		177,234.75
Broward County True-Up Charge (prior year)		10,613.81
LBS True-up from Prior Year		(61,272.13)
Subtotal: Fixed Annual Charges	\$	161,441.24
Calculated Monthly Charge		\$ 13,453.44

II. Volumetric Charge Components - Annual Cost		
Lift Station #12 Costs: (1)		
LS#12 Electrical	\$	9,818.61
LS#12 Chemical		72,370.19
LS#12 Personnel Pumping		33,025.91
LS#12 Other Pumping		7,824.55
LS#12 Admin. & General Expense		21,834.19
	\$	144,873.45
Plus 25% Surcharge		36,218.36
Subtotal: LS# 12 Costs	\$	181,091.81
Estimated Flow (based on 3-year average) (in kgal)		208,224
LS#21 Volumetric Rate (\$/kgal)	\$	0.870
Broward County Rate	\$	0.676
Plus: IR&R Charge of \$.05	\$	0.050
Subtotal: Broward County Rate (\$/kgal)	\$	0.726
Total Volumetric Rate per 1,000 gallons (2)		\$ 1.5957

Total Projected Annual Cost (2)	\$	493,703.92
Total Projected Monthly Cost	\$	41,141.99
Total Annual Cost converted to a Volumetric Rate	\$	2.371
(For comparison purposes only.)		

- (1) Based on budgeted costs for FY 2009
 (2) Due to rounding, the total volumetric rate times the estimated flow plus the annual fixed charges might be slightly different than the total projected annual cost shown.

Comparison

	Rate Assessed	Previous Methodology	New Methodology
	FY 2007 - To Present	2009	2009
I. Fixed Charge Components - Annual Cost			
Availability Charge:			
Lift Station #12	\$ 17,922.57	\$ 17,922.57	\$ 17,922.57
A1A Force Main	\$ 16,942.25	\$ 16,942.25	\$ 16,942.25
(1) Broward County Reserved Capacity Charge			\$ 177,234.75
(1) Broward County True-Up Charge (prior year)			\$ 10,613.81
(1) LBS True-up from Prior Year			\$ (61,272.13)
Subtotal: Fixed Annual Charges	\$ 34,864.82	\$ 34,864.82	\$ 161,441.24
Calculated Monthly Charge	\$ 2,905.40	\$ 2,905.40	\$ 13,453.44
II. Volumetric Charge Components - Annual Cost			
Broward County Costs			
(1) Broward County Reserved Capacity Charge	\$ 155,582.70	\$ 177,234.75	\$ -
(1) Broward County True-Up Charge (prior year)	\$ 212.12	\$ 10,613.81	\$ -
(1) LBS True-up from Prior Year	\$ 12,805.02	\$ (61,272.13)	\$ -
	\$ 168,599.84	\$ 126,576.43	\$ -
Lift Station #12 Costs:			
LS#12 Electrical	\$ 13,241.29	\$ 9,818.61	\$ 9,818.61
LS#12 Chemical	\$ 43,432.50	\$ 72,370.19	\$ 72,370.19
LS#12 Personnel Pumping	\$ 41,461.85	\$ 33,025.91	\$ 33,025.91
LS#12 Other Pumping	\$ 7,270.92	\$ 7,824.55	\$ 7,824.55
LS#12 Admin. & General Expense	\$ 26,026.41	\$ 21,834.19	\$ 21,834.19
	\$ 131,432.97	\$ 144,873.45	\$ 144,873.45
Plus 25% Surcharge	\$ 32,858.24	\$ 36,218.36	\$ 36,218.36
Subtotal: LS# 12 Costs	\$ 164,291.21	\$ 181,091.81	\$ 181,091.81
Total Volumetric Charge Components	\$ 332,891.05	\$ 307,668.24	\$ 181,091.81
Estimated Flow (based on 3-year average) (in kgal)	220,444	208,224	208,224
Volumetric Rate (\$/kgal)	\$ 1.510	\$ 1.478	\$ 0.870
Broward County Rate	\$ 0.689	\$ 0.676	\$ 0.676
Plus: IR&R Charge of 2.5% ('06 and '07)/ \$.05 ('08 and '09)	\$ 0.017	\$ 0.050	\$ 0.050
Subtotal: Broward County Rate (\$/kgal)	\$ 0.706	\$ 0.726	\$ 0.726
Total Volumetric Rate per 1,000 gallons	\$ 2.216	\$ 2.204	\$ 1.596
		-0.6%	
Total Projected Annual Cost	\$ 523,438.93	\$ 493,703.92	\$ 493,703.92
Total Projected Monthly Cost	\$ 43,619.91	\$ 41,141.99	\$ 41,141.99
Total Annual Cost converted to a Volumetric Rate	\$ 2.374	\$ 2.371	\$ 2.371

(1) These costs were once part of the volumetric component but are now being included in the fixed component.

City of Pompano Beach
Calculation for Lauderdale by the Sea ("LBS") - True-Up

A. Availability Costs (Fixed Costs)

		Allocation Percentage	2006	2007	2008
1) Lift Station #21					
Total Construction Costs	\$ 964,829				
% Allocated to LBS	\$ 241,207	25.0%			
Annual Debt Service Payment					
Interest rate ('93 Bonds) =	5.16%	4.11%			
Term (years) =	20	20			
Annual Cost to LBS			\$19,618.54	\$19,618.54	\$17,922.57
Monthly Cost to LBS			\$1,634.88	\$1,634.88	\$1,493.55
2) A1A Force Main					
Total Construction Costs	\$ 542,331				
% Allocated to LBS	\$ 271,166	50.0%			
Annual Debt Service Payment					
Interest rate (current market) =	4.65%				
Term (facility lifetime) =	30				
Annual Cost to LBS			\$16,942.25	\$16,942.25	\$16,342.25
Monthly Cost to LBS			\$1,411.85	\$1,411.85	\$1,411.85
Total Availability Costs to LBS					
Annual Cost			\$36,560.79	\$36,560.79	\$34,864.82
Monthly Cost			\$3,046.73	\$3,046.73	\$2,905.40
Unit Cost			\$ 0.181	\$ 0.181	\$ 0.158

B. Cost per 1,000 Gallons (Volume Costs)

			2006	2007	2008
Total LBS annual flow (kgals)			201,568	202,136	220,969
Total flow from L.S. #21 (kgals)			817,748	827,368	822,558
Total flow delivered to Broward County (kgals)			5,213,300	5,005,130	4,918,370
% of annual LBS flow to annual L.S. #21 flow			24.65%	24.43%	26.86%
% of annual L.S. #21 flow to total annual flow delivered to Broward County			15.69%	16.53%	16.72%
% of annual LBS flow to total annual flow delivered to Broward County			3.87%	4.04%	4.49%
1) Wastewater Treatment Cost to LBS					
A. Broward County Rate (\$/kgals treated)					
IR&R Factor			\$ 0.583	\$ 0.689	\$ 0.687
			2.50%	2.50%	0.05
					\$ 0.737
Annual Cost to LBS (plus IR&R Factor)			\$ 120,452.00	\$ 142,753.50	\$ 162,854.15
Unit Cost			\$ 0.5976	\$ 0.7062	\$ 0.7370
B. Reserved capacity for LBS					
Wastewater Treatment Debt Service (\$/mo/MGD reserved)	1.25		\$ 10,027.28	\$ 10,372.18	\$ 10,193.09
Annual Cost to LBS (plus IR&R Factor)			\$ 154,169.47	\$ 159,472.27	\$ 160,541.22
Unit Cost			\$ 0.7649	\$ 0.7889	\$ 0.7265
C. Broward County True-Up Charge for prior year					
(Includes IR&R Factor)			\$ 5,078.27	\$ 3,802.48	\$ 236,244.26
% Allocation based on LBS actual flow to total flow delivered to Broward County, from prior year			4.18%	3.87%	4.04%
Annual Cost Allocated to LBS			\$ 212.12	\$ 147.02	\$ 9,540.90
Unit Cost			\$ 0.0011	\$ 0.0007	\$ 0.0432
Total Wastewater Treatment Cost to LBS					
Unit Cost			\$ 1.363	\$ 1.496	\$ 1.507

2) Lift Station #21 O&M Costs

	2006	2007	2008
A. Total Pumping Electrical Costs	\$ 358,764.00	\$ 324,889.28	\$ 359,215.00
L.S. #21 Electrical & Water Costs	\$ 40,647.31	\$ 35,148.92	\$ 38,810.12
% of L.S.#21 electrical pumping costs to total electrical pumping costs (2)	11.33%	10.82%	10.80%
Calculation of Annual Electrical Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 10,019.22	\$ 8,587.31	\$ 10,425.81
B. L.S. #21 Chemical Costs	\$ -	\$ 25,273.83	\$ 255,571.21
Calculation of Annual Chemical Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ -	\$ 6,174.70	\$ 58,655.72
C. Personnel Pumping Costs			
Pumping Personnel Costs	\$ 798,535.00	\$ 906,880.90	\$ 940,936.00
Pumping Internal Services	\$ 307,752.00	\$ 276,407.00	\$ 338,369.00
Total Personnel Pumping Costs	\$ 1,106,287.00	\$ 1,183,287.90	\$ 1,279,305.00
% of L.S.#21 electrical pumping costs to total electrical pumping costs (2)	11.33%	10.82%	10.80%
Allocation of Personnel Pumping Costs to L.S. #21 (2)	\$ 125,340.31	\$ 128,016.82	\$ 138,218.00
Calculation of Annual Personnel Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 30,895.33	\$ 31,276.06	\$ 37,130.38
D. Other Pumping Expenses	\$ 256,223.00	\$ 281,926.36	\$ 191,134.00
Allocation of Other Pumping Expenses to L.S. #21 (based on % of L.S. #21 flow delivered to Broward County)	\$ 40,190.64	\$ 46,603.55	\$ 31,965.63
Calculation of Annual Other Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 9,906.65	\$ 11,385.81	\$ 8,587.13
E. Sewer Admin and General Plant Expenses			
Sewer Admin	\$ 1,168,856.00	\$ 849,889.91	\$ 864,506.00
General Plant Expense	\$ 344,933.00	\$ 387,521.98	\$ 249,128.00
Total Sewer Admin and General Plant Expenses	\$ 1,511,789.00	\$ 1,237,411.89	\$ 1,113,634.00
Total Pumping Expenses	\$ 1,758,064.00	\$ 1,836,821.82	\$ 2,216,273.00
Total Transmission Exp.	\$ 2,645,977.00	\$ 2,098,899.08	\$ 2,006,101.00
Total Pumping & Transmission Expenses	\$ 4,404,041.00	\$ 3,935,720.90	\$ 4,222,374.00
% of pumping expenses to transmission expenses	39.92%	46.67%	52.49%
Allocation of Admin/Gen. Plant Costs to L.S. #21 (based on % of pump/transm. and % of L.S. #21 flow delivered to Broward County)	\$ 94,663.22	\$ 95,464.17	\$ 97,758.46
Calculation of Annual Admin and General Plant Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 23,333.69	\$ 23,323.05	\$ 26,261.48
Subtotal: L.S. #21 O&M Costs	\$ 74,154.89	\$ 80,746.92	\$ 151,060.53
Plus 25% Surcharge	\$ 18,538.72	\$ 20,186.73	\$ 37,765.13
Total L.S. #21 O&M Costs	\$ 92,693.62	\$ 100,933.66	\$ 188,825.66
Unit Cost	\$ 0.460	\$ 0.499	\$ 0.855
Total Volume Costs (sum of wastewater treatment costs plus L.S. #21 O&M costs)	\$ 367,527.20	\$ 403,306.44	\$ 521,761.94
Total ACTUAL Annual Cost to LBS (sum of availability costs plus volume costs)	\$ 404,087.99	\$ 439,867.23	\$ 556,626.76
UNIT COST	\$ 1.823	\$ 1.995	\$ 2.361
Actual Revenues from LBS	\$ 451,320.00	\$ 486,002.00	\$ 524,532.11
Additional Payment/(Credit) to be applied to second subsequent fiscal year	\$ (47,232.01)	\$ (46,134.77)	\$ 32,094.65



UTILITIES ADMINISTRATION

A. RANDOLPH BROWN
Director

1205 N.E. 5th Avenue
Pompano Beach, Florida 33060



Phone: 954-545-7043

City of Pompano Beach, Florida

Fax: 954-545-7046

December 16, 2009

Ms. Kaola King, Finance Director
Town of Lauderdale by the Sea
4501 Ocean Drive
Lauderdale by the Sea, FL 33308

SUBJECT: Annual Rate Adjustment

Dear Ms. King:

The Wastewater Service Agreement between the City of Pompano Beach and the Town of Lauderdale by the Sea stipulates an annual recalculation of the monthly and volumetric rates. Enclosed for your review is a memo from our rate consultant, Raftelis Financial Consultants Inc., outlining the recalculation of the rate for fiscal year 2010.

Your rates for fiscal year 2010 will be:

\$ 21,548.59 monthly charge
\$ 1.677 volumetric rate per 1,000 gallons

The fiscal year 2010 monthly amount will be implemented effective with your January 1, 2010 billing.

Once you have had time to review the Raftelis memo, please let me know if you have any questions. I'd be glad to set up a phone conference with our consultant, if necessary, to review the calculations.

Sincerely,

A. Randolph Brown,
Utilities Director

C: Ms. Suzette Sibble, Finance Director
Mr. Kyle McPhail, Customer Service Manager
Mr. Dennis Beach, City Manager

Date December 17, 2009

To: Randy Brown, Utilities Director, City of Pompano Beach
From: Lex Warmath, Vice President, Raftelis Financial Consultants, Inc.

Re: FY 2010 Calculation of Wholesale Wastewater Treatment Rate for Lauderdale-by-the-Sea

The City of Pompano Beach ("City") and the Town of Lauderdale-by-the-Sea ("LBS") have entered into a fifteen-year contract whereby the City will continue to provide wastewater transmission and treatment services ("wholesale services") to LBS. The current fee structure used to charge LBS for the wholesale services includes a monthly fixed component of \$13,453.44 and a volumetric rate component of \$1.596 per 1,000 gallons of usage. These rates and charges were implemented beginning January 1, 2009.

Using the City's FY 2010 budget, the updated treatment rates provided by Broward County, and the true-up from FY 2009, the new LBS rates and charges for FY 2010, to be implemented beginning January 1, 2010, include a monthly fee of \$21,458.59 and a volumetric rate of \$1.677 per 1,000 gallons. A summary of this calculation is provided in the schedules attached to this memorandum, as well as a comparison of the rate calculations for FY 2009 and FY 2010. As shown in the comparison, the proposed monthly and volumetric components are substantially higher for 2010 due to a number of factors, including the following.

- Treatment rates charged by Broward County increased from \$0.676 to \$0.795 per 1,000 gallons, an increase of 17.6%.
- The reserved capacity charge for debt service costs assessed by Broward County increased from \$11,253.00 (excluding the 5% IR&R factor) per MGD per month to \$12,256.44 per MGD per month (effective October 1, 2009), which is a 11.6% increase.
- The true-up component for the rate charged to LBS by the City shifted from a credit applied in 2009 of \$61,272.13, based on the credits accumulated over the prior three years (2006 - 2008), to a true-up shortfall of \$20,635.55, based on revenues collected and costs incurred during FY 2009. A significant portion of this shortfall is due to an increase in the reserved capacity charge that was implemented by Broward County in April of 2009, and that was not passed through as an adjustment to the fixed component of the fees charged by the City to LBS.

Although the City increased its reserved capacity allocation in the Broward County plant from 15.71 to 17.0 MGD, with a corresponding increase in the total amount of the reserved capacity

charge, the level of reserved capacity allocated to LBS remained unchanged at 1.25 MGD. As a result, the increase in the amount of the reserved capacity charge allocated to LBS is a result only of the increase in the amount of the charge per MGD assessed by Broward County. In addition, the City received a reimbursement from Broward County in November 2009, in the amount of \$208,716, which was a reimbursement for a portion of prior year contributions for the treatment plant expansion. This reimbursement has been factored into the calculation of the total treatment costs paid to Broward County for the purpose of determining the level of the true-up shortfall included in the new rates structure to be applied to LBS in 2010.

Calculated FY 2010 Rate

	Fiscal Year
	2010 (1)
I. Fixed Charge Components - Annual Cost	Projected
Availability Charge:	
Lift Station #12	\$ 17,922.57
A1A Force Main	16,942.25
Broward County Reserved Capacity Charge	197,842.68
Broward County True-Up Charge (prior year)	4,159.99
LBS True-up from Prior Year	20,635.55
Subtotal: Fixed Annual Charges	\$ 257,503.04
Calculated Monthly Charge	
	\$ 21,458.59

II. Volumetric Charge Components - Annual Cost	
Lift Station #12 Costs: (1)	
LS#12 Electrical	\$ 9,652.53
LS#12 Chemical	71,312.19
LS#12 Personnel Pumping	32,388.20
LS#12 Other Pumping	8,547.60
LS#12 Admin. & General Expense	21,522.14
Subtotal	\$ 143,422.66
Plus 25% Surcharge	35,855.66
Subtotal: LS# 12 Costs	\$ 179,278.32
Estimated Flow (based on 3-year average) (in kgal)	215,378
LS#21 Volumetric Rate (\$/kgal)	\$ 0.832
Broward County Rate	\$ 0.795
Plus: IR&R Charge of \$.05	\$ 0.050
Subtotal: Broward County Rate (\$/kgal)	\$ 0.845
Total Volumetric Rate per 1,000 gallons (2)	
	\$ 1.677

Total Projected Annual Cost (2)	\$ 618,775.49
Total Projected Monthly Cost	\$ 51,564.62
Total Annual Cost converted to a Volumetric Rate	\$ 2.873
(For comparison purposes only.)	

- (1) Based on budgeted costs for FY 2010
 (2) Due to rounding, the total volumetric rate times the estimated flow plus the annual fixed charges might be slightly different than the total projected annual cost shown.

Comparison

	Fiscal Year		% Increase
	2009	2010 (1)	
	Projected	Projected	
I. Fixed Charge Components - Annual Cost			
Availability Charge:			
Lift Station #12	\$ 17,922.57	\$ 17,922.57	
A1A Force Main	16,942.25	16,942.25	
Broward County Reserved Capacity Charge	177,234.75	197,842.68	11.63%
Broward County True-Up Charge (prior year)	10,613.81	4,159.99	
LBS True-up from Prior Year	(61,272.13)	20,635.55	
Subtotal: Fixed Annual Charges	\$ 161,441.24	\$ 257,503.04	
Calculated Monthly Charge	\$ 13,453.44	\$ 21,458.59	59.50%
II. Volumetric Charge Components - Annual Cost			
Lift Station #12 Costs: (1)			
LS#12 Electrical	\$ 9,818.61	\$ 9,652.53	
LS#12 Chemical	72,370.19	71,312.19	
LS#12 Personnel Pumping	33,025.91	32,388.20	
LS#12 Other Pumping	7,824.55	8,547.60	
LS#12 Admin. & General Expense	21,834.19	21,522.14	
Subtotal	\$ 144,873.45	\$ 143,422.66	
Plus 25% Surcharge	36,218.36	35,855.66	
Subtotal: LS# 12 Costs	\$ 181,091.81	\$ 179,278.32	-1.00%
Estimated Flow (based on 3-year average) (in kgal)	208,224	215,378	
LS#21 Volumetric Rate (\$/kgal)	\$ 0.870	\$ 0.832	-4.29%
Broward County Rate	\$ 0.676	\$ 0.795	17.60%
Plus: IR&R Charge of \$.05	\$ 0.050	\$ 0.050	
Subtotal: Broward County Rate (\$/kgal)	\$ 0.726	\$ 0.845	16.39%
Total Volumetric Rate per 1,000 gallons (2)	\$ 1.596	\$ 1.677	5.12%
Total Projected Annual Cost (2)	\$ 493,703.92	\$ 618,775.49	25.33%
Total Projected Monthly Cost	\$ 41,141.99	\$ 51,564.62	
Total Annual Cost converted to a Volumetric Rate (For comparison purposes only.)	\$ 2,371	\$ 2,873	

(1) Based on budgeted costs for FY 2010
 (2) Due to rounding, the total volumetric rate times the estimated flow plus the annual fixed charges might be slightly different than the total projected annual cost shown.

City of Pompano Beach
 Calculation for Lauderdale by the Sea ("LBS") - True-Up

		Allocation Percentage	Actual Costs	
			2008	2009
A. Availability Costs (Fixed Costs)				
1) Lift Station #21				
Total Construction Costs		\$ 964,829		
% Allocated to LBS		\$ 241,207	25.0%	
Annual Debt Service Payment				
Annual Cost to LBS			\$17,922.57	\$17,922.57
Monthly Cost to LBS			\$1,493.55	\$1,493.55
2) A1A Force Main				
Total Construction Costs		\$ 542,331		
% Allocated to LBS		\$ 271,166	50.0%	
Annual Debt Service Payment				
Annual Cost to LBS			\$16,942.25	\$16,942.25
Monthly Cost to LBS			\$1,411.85	\$1,411.85
Total Availability Costs to LBS				
Annual Cost			\$34,864.82	\$34,864.82
Monthly Cost			\$2,905.40	\$2,905.40
Unit Cost (For comparison purposes only)			\$ 0.1578	\$ 0.1563
B. Cost per 1,000 Gallons (Volume Costs)				
Actual Flow/Usage Data:				
Total LBS annual flow (kgals)			220,969	223,028
Total flow from L.S. #21 (kgals)			822,558	940,391
Total flow delivered to Broward County (kgals)			4,918,370	4,408,880
% of annual LBS flow to annual L.S. #21 flow			26.86%	23.72%
% of annual L.S. #21 flow to total annual flow delivered to Broward County			16.72%	21.33%
% of annual LBS flow to total annual flow delivered to Broward County			4.49%	5.06%
1) Wastewater Treatment Cost to LBS				
A. Broward County Rate (\$/kgals treated)				
IR&R Factor			\$ 0.6870	\$ 0.6760
			\$ 0.0500	\$ 0.0500
		Total Unit Cost	\$ 0.7370	\$ 0.7260
Annual Cost to LBS (plus IR&R Factor)			\$ 162,854.15	\$ 161,918.33
B. Reserved capacity for LBS				
Wastewater Treatment Debt Service	1.25	MGD		
(\$/mo/MGD reserved)			\$ 10,193.09	\$ 11,645.13
Annual Cost to LBS (plus IR&R Factor)			\$ 160,541.22	\$ 183,410.81
Unit Cost (For comparison purposes only)			\$ 0.7265	\$ 0.8224
C. Broward County True-Up Charge for prior year				
(Includes IR&R Factor)			\$ 236,244.26	\$ 82,235.89
% Allocation based on LBS actual flow to total flow delivered to Broward County, from prior year			4.04%	4.49%
Annual Cost Allocated to LBS			\$ 9,540.90	\$ 3,694.64
Unit Cost (For comparison purposes only)			\$ 0.0432	\$ 0.0166
Total Wastewater Treatment Cost to LBS				
Unit Cost (For comparison purposes only)			\$ 1.5067	\$ 1.5649

	Actual Costs	
	2008	2009
2) Lift Station #21 O&M Costs		
A. Total Pumping Electrical Costs	\$ 359,215.00	\$ 357,769.16
L.S. #21 Electrical & Water Costs	\$ 38,810.12	\$ 38,563.88
% of L.S.#21 electrical pumping costs to total electrical pumping costs	10.80%	10.78%
Calculation of Annual Electrical Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 10,425.81	\$ 9,146.01
B. L.S. #21 Chemical Costs	\$ 255,571.21	\$ 244,801.30
Calculation of Annual Chemical Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 68,655.72	\$ 58,058.34
C. Personnel Pumping Costs		
Pumping Personnel Costs	\$ 940,936.00	\$ 928,403.46
Pumping Internal Services	\$ 338,369.00	\$ 280,169.00
Total Personnel Pumping Costs	\$ 1,279,305.00	\$ 1,208,572.46
% of L.S.#21 electrical pumping costs to total electrical pumping costs	10.80%	10.78%
Allocation of Personnel Pumping Costs to L.S. #21	\$ 138,218.00	\$ 130,271.83
Calculation of Annual Personnel Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 37,130.38	\$ 30,895.94
D. Other Pumping Expenses	\$ 191,134.00	\$ 202,553.53
Allocation of Other Pumping Expenses to L.S. #21 (based on % of L.S. #21 flow delivered to Broward County)	\$ 31,965.63	\$ 43,203.61
Calculation of Annual Other Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 8,587.13	\$ 10,246.39
E. Sewer Admin and General Plant Expenses		
Sewer Admin	\$ 864,506.00	\$ 998,176.75
General Plant Expense	\$ 249,128.00	\$ 55,076.75
Total Sewer Admin and General Plant Expenses	\$ 1,113,634.00	\$ 1,053,253.50
Total Pumping Expenses	\$ 2,216,273.00	\$ 2,146,230.83
Total Transmission Exp.	\$ 2,006,101.00	\$ 2,171,952.67
Total Pumping & Transmission Expenses	\$ 4,222,374.00	\$ 4,318,183.50
% of pumping expenses to transmission expenses	52.49%	49.70%
Allocation of Admin/Gen. Plant Costs to L.S. #21 (based on % of pump/transm. and % of L.S. #21 flow delivered to Broward County)	\$ 97,758.46	\$ 111,657.65
Calculation of Annual Admin and General Plant Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 26,261.48	\$ 26,481.30
Subtotal: L.S. #21 O&M Costs	\$ 151,060.53	\$ 134,827.98
Plus 25% Surcharge	\$ 37,765.13	\$ 33,706.99
Total L.S. #21 O&M Costs	\$ 188,825.66	\$ 168,534.97
Unit Cost	\$ 0.855	\$ 0.756
Total Volume Costs (sum of wastewater treatment costs plus L.S. #21 O&M costs)	\$ 521,761.94	\$ 517,558.74
Total ACTUAL Annual Cost to LBS (sum of availability costs plus volume costs)	\$ 556,626.76	\$ 552,423.56
UNIT COST	\$ 2.361	\$ 2.321
Actual Revenues from LBS	\$ 524,532.11	\$ 531,788.01
Additional Payment/(Credit) to be applied to following fiscal year (1)	\$ 32,094.65	\$ 20,635.55

(1) The amount of the True-up calculated for FY 2008 is different than the amount that was actually applied in FY 2009, since the amount applied in FY 2009 (a credit of \$61,272.13) is the sum of the accumulated true-up over a three year period.



UTILITIES ADMINISTRATION

A. RANDOLPH BROWN
Director

1205 N.E. 5th Avenue
Pompano Beach, Florida 33060



Phone: 954-545-7043

City of Pompano Beach, Florida

Fax: 954-545-7046

January 3, 2011

Mr. Doug Haag, Acting Finance Director
Town of Lauderdale by the Sea
4501 Ocean Drive
Lauderdale by the Sea, FL 33308

SUBJECT: Annual Rate Adjustment

Dear Mr. Haag:

The Wastewater Service Agreement between the City of Pompano Beach and the Town of Lauderdale by the Sea stipulates an annual recalculation of the monthly and volumetric rates. Enclosed for your review is a memo from our rate consultant, Raftelis Financial Consultants Inc., outlining the recalculation of the rate for the 2011 calendar year.

Your rates for calendar year 2011 will be:

\$ 24,267.20 monthly charge
\$ 1.917 volumetric rate per 1,000 gallons

The fiscal year 2011 monthly amount will be implemented effective with your January 1, 2011 billing.

I did discuss these new rates with Mr. Bentley last week. Once you have had time to review the Raftelis memo, please let me know if you have any questions. I'd be glad to set up a phone conference with our consultant, if necessary, to review the calculations.

Sincerely,

A. Randolph Brown,
Utilities Director

- C: Ms. Connie Hoffmann, Town Manager
Mr. Ralph 'Bud' Bentley, Assistant Town Manager
Ms. Suzette Sibble, Finance Director
Mr. Kyle McPhail, Customer Service Manager
Mr. Dennis Beach, City Manager



RAFTELIS FINANCIAL
CONSULTANTS, INC.

■ 1031 S. Caldwell Street,
Suite 100
Charlotte • NC • 28203

■ Phone 704 • 373 • 1199
Fax 704 • 373 • 1113

■ www.raftelis.com

Date December 29, 2010

To: Randy Brown, Utilities Director, City of Pompano Beach
From: Lex Warmath, Vice President, Raftelis Financial Consultants, Inc.

Re: FY 2011 Calculation of Wholesale Wastewater Treatment Rate for Lauderdale-by-the-Sea

The City of Pompano Beach ("City") and the Town of Lauderdale-by-the-Sea ("LBS") have entered into a fifteen-year contract whereby the City will continue to provide wastewater transmission and treatment services ("wholesale services") to LBS. The current fee structure for the wholesale services includes a monthly fixed component of \$21,458.59 and a volumetric rate component of \$1.677 per 1,000 gallons of usage. These rates and charges were implemented beginning January 1, 2010.

Using the City's FY 2011 budget, the updated treatment rates provided by Broward County, and the true-up from FY 2010, the new LBS rates and charges for FY 2011, to be implemented beginning January 1, 2011, include a monthly fee of **\$24,267.20** and a volumetric rate of **\$1.917** per 1,000 gallons. A summary of this calculation is provided in the schedules attached to this memorandum, as well as a comparison of the rate calculations for FY 2010 and FY 2011. As shown in the comparison, the proposed monthly and volumetric components are higher for 2011 due to several factors, including the following:

Fixed Charge Components

- Broward County's reserved capacity charge increased by 2.3% and therefore LBS's share of this cost increased 2.3% over the prior year.
- The true-up component that reflects the difference in the rates LBS paid the City compared to the actual costs incurred by the City to serve LBS was \$51,876. A significant portion of this true-up is due to Broward County's true-up for the prior year which was \$490,213. Based on the proportion of LBS's total flow to the City's total flow sent to Broward County, LBS's share of Broward County's true-up is approximately \$21,475.95. The remaining true-up (\$51,876 less \$21,475 = \$27,078) is due to the actual true-up resulting from the difference in the City's projected costs to actual costs incurred in 2010 to serve LBS.

Volumetric Charge Component

- Treatment rates charged by Broward County beginning October 1, 2010 increased from \$0.795 to \$0.886 per 1,000 gallons, an increase of 11.45%.

Randy Brown, Utilities Director
City of Pompano Beach

December 29, 2009
Page 2

- The City's projected pumping and administration and general expenses are anticipated to increase in FY 2011 due mainly to capital outlays.

The changes listed above result in a monthly fee of \$24,267.20 and a volumetric rate of \$1,917 per 1,000 gallon. Comparing these rates to the rates paid by LBS in 2010, LBS will experience an increase of approximately 13% in the monthly charge and 14.3% in the volumetric charge paid to the City for wastewater service.

Calculated FY 2011 Rate

	Fiscal Year
	2011 (1)
	Projected
I. Fixed Charge Components - Annual Cost	
Availability Charge:	
Lift Station #12	\$ 17,922.57
A1A Force Main	16,942.25
Broward County Reserved Capacity Charge	202,374.59
Broward County True-Up Charge (prior year)	2,090.71
LBS True-up from Prior Year	51,876.32
Subtotal: Fixed Annual Charges	\$ 291,206.43
Calculated Monthly Charge	
	\$ 24,267.20

II. Volumetric Charge Components - Annual Cost	
Lift Station #12 Costs: (1)	
LS#12 Electrical	\$ 9,490.97
LS#12 Chemical	66,359.01
LS#12 Personnel Pumping	35,082.71
LS#12 Other Pumping	13,985.00
LS#12 Admin. & General Expense	34,125.66
Subtotal	\$ 159,043.35
Plus 25% Surcharge	39,760.84
Subtotal: LS# 12 Costs	\$ 198,804.19
Estimated Flow (in kgal)	202,713
LS#21 Volumetric Rate (\$/kgal)	\$ 0.981
Broward County Rate	\$ 0.886
Plus: IR&R Charge of \$.05	\$ 0.050
Subtotal: Broward County Rate (\$/kgal)	\$ 0.936
Total Volumetric Rate per 1,000 gallons (2)	
	\$ 1.917

Total Projected Annual Cost (2)	\$ 679,749.98
Total Projected Monthly Cost	\$ 56,645.83
Total Annual Cost converted to a Volumetric Rate (For comparison purposes only.)	\$ 3.353

- (1) Based on budgeted costs for FY 2011
 (2) Due to rounding, the total volumetric rate times the estimated flow plus the annual fixed charges might be slightly different than the total projected annual cost shown.

Comparison

	Fiscal Year		% Increase
	2010 Projected	2011 (1) Projected	
I. Fixed Charge Components - Annual Cost			
Availability Charge			
Lift Station #12	\$ 17,922.57	\$ 17,922.57	
A1A Force Main	16,942.25	16,942.25	
Broward County Reserved Capacity Charge	197,842.68	202,374.59	2.29%
Broward County True-Up Charge (prior year)	4,159.99	2,090.71	
LBS True-up from Prior Year	20,635.55	51,876.32	151.39%
Subtotal: Fixed Annual Charges	\$ 257,503.04	\$ 291,206.43	
Calculated Monthly Charge	\$ 21,458.59	\$ 24,267.20	13.09%
II. Volumetric Charge Components - Annual Cost			
Lift Station #12 Costs: (1)			
LS#12 Electrical	\$ 9,652.53	\$ 9,490.97	
LS#12 Chemical	71,312.19	66,359.01	
LS#12 Personnel Pumping	32,388.20	35,082.71	
LS#12 Other Pumping	8,547.60	13,985.00	
LS#12 Admin. & General Expense	21,522.14	34,125.66	
Subtotal	\$ 143,422.66	\$ 159,043.35	10.89%
Plus 25% Surcharge	35,855.66	39,760.84	
Subtotal: LS# 12 Costs	\$ 179,278.32	\$ 198,804.19	
Estimated Flow (in kgal)	215,378	202,713	
LS#21 Volumetric Rate (\$/kgal)	\$ 0.832	\$ 0.981	
Broward County Rate	\$ 0.795	\$ 0.886	11.45%
Plus: IR&R Charge of \$.05	\$ 0.050	\$ 0.050	
Subtotal: Broward County Rate (\$/kgal)	\$ 0.845	\$ 0.936	10.77%
Total Volumetric Rate per 1,000 gallons (2)	\$ 1.677	\$ 1.917	14.27%
Total Projected Annual Cost (2)	\$ 618,775.49	\$ 679,749.98	
Total Projected Monthly Cost	\$ 51,564.62	\$ 56,645.83	
Total Annual Cost converted to a Volumetric Rate (For comparison purposes only.)	\$ 2.873	\$ 3.353	

(1) Based on budgeted costs for FY 2011
(2) Due to rounding, the total volumetric rate times the estimated flow plus the annual fixed charges might be slightly different than the total projected annual cost shown.

**City of Pompano Beach
 Calculation for Lauderdale by the Sea ("LBS") - True-Up**

	Allocation Percentage	Actual Costs	
		2009	2010
A. Availability Costs (Fixed Costs)			
1) Lift Station #21			
Total Construction Costs	\$ 964,829		
% Allocated to LBS	\$ 241,207	25.0%	
Annual Debt Service Payment			
Annual Cost to LBS		\$17,922.57	\$17,922.57
Monthly Cost to LBS		\$1,493.55	\$1,493.55
2) A1A Force Main			
Total Construction Costs	\$ 542,331		
% Allocated to LBS	\$ 271,166	50.0%	
Annual Debt Service Payment			
Annual Cost to LBS		\$16,942.25	\$16,942.25
Monthly Cost to LBS		\$1,411.85	\$1,411.85
Total Availability Costs to LBS			
Annual Cost		\$34,864.82	\$34,864.82
Monthly Cost		\$2,905.40	\$2,905.40
Unit Cost (For comparison purposes only)		\$ 0.1563	\$ 0.1720
B. Cost per 1,000 Gallons (Volume Costs)			
Actual Flow/Usage Data:			
Total LBS annual flow (kgals)		223,028	202,713*
Total flow from L.S. #21 (kgals)		940,391	835,197*
Total flow delivered to Broward County (kgals)		4,408,880	4,627,160
% of annual LBS flow to annual L.S. #21 flow		23.72%	24.27%
% of annual L.S. #21 flow to total annual flow delivered to Broward County		21.33%	18.05%
% of annual LBS flow to total annual flow delivered to Broward County		5.06%	4.38%
1) Wastewater Treatment Cost to LBS			
A. Broward County Rate (\$/kgals treated)			
IR&R Factor		\$ 0.6760	\$ 0.7950
		\$ 0.0500	\$ 0.0500
Total Unit Cost		\$ 0.7260	\$ 0.8450
Annual Cost to LBS (plus IR&R Factor)		\$ 161,918.33	\$ 171,292.49
B. Reserved capacity for LBS			
Wastewater Treatment Debt Service (\$/mo/MGD reserved)	1.25 MGD	\$ 11,645.13	\$ 12,561*
Annual Cost to LBS (plus IR&R Factor)		\$ 183,410.81	\$ 197,842.70
Unit Cost (For comparison purposes only)		\$ 0.8224	\$ 0.9760
C. Broward County True-Up Charge for prior year			
(Includes IR&R Factor)		\$ 82,235.89	\$ 490,213.00
% Allocation based on LBS actual flow to total flow delivered to Broward County, from prior year		4.49%	5.06%
Annual Cost Allocated to LBS		\$ 3,694.64	\$ 24,797.96
Unit Cost (For comparison purposes only)		\$ 0.0166	\$ 0.1223
Total Wastewater Treatment Cost to LBS			
Unit Cost (For comparison purposes only)		\$ 1.5649	\$ 1.0983

	Actual Costs	
	2009	2010
2) Lift Station #21 O&M Costs		
A. Total Pumping Electrical Costs	\$ 357,769.16	\$ 325,252.09
L.S. #21 Electrical & Water Costs	\$ 38,563.88	\$ 35,427.77
% of L.S.#21 electrical pumping costs to total electrical pumping costs	10.78%	10.89%
Calculation of Annual Electrical Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 9,146.01	\$ 8,598.77
B. L.S. #21 Chemical Costs	\$ 244,801.30	\$ 301,927.99
Calculation of Annual Chemical Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 58,058.34	\$ 73,281.77
C. Personnel Pumping Costs		
Pumping Personnel Costs	\$ 928,403.46	\$ 919,346.21
Pumping Internal Services	\$ 260,169.00	\$ 281,479.00
Total Personnel Pumping Costs	\$ 1,208,572.46	\$ 1,200,825.21
% of L.S.#21 electrical pumping costs to total electrical pumping costs	10.78%	10.89%
Allocation of Personnel Pumping Costs to L.S. #21	\$ 130,271.83	\$ 130,798.73
Calculation of Annual Personnel Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 30,895.94	\$ 31,746.52
D. Other Pumping Expenses	\$ 202,553.53	\$ 250,718.69
Allocation of Other Pumping Expenses to L.S. #21 (based on % of L.S. #21 flow delivered to Broward County)	\$ 43,203.61	\$ 45,254.44
Calculation of Annual Other Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 10,246.39	\$ 10,983.83
E. Sewer Admin and General Plant Expenses		
Sewer Admin	\$ 998,176.75	\$ 911,059.66
General Plant Expense	\$ 55,078.75	\$ 207,933.21
Total Sewer Admin and General Plant Expenses	\$ 1,053,255.50	\$ 1,118,992.87
Total Pumping Expenses	\$ 2,146,230.83	\$ 1,939,833.86
Total Transmission Exp.	\$ 2,171,952.67	\$ 2,138,748.72
Total Pumping & Transmission Expenses	\$ 4,318,183.50	\$ 4,078,582.58
% of pumping expenses to transmission expenses	49.70%	47.56%
Allocation of Admin/Gen. Plant Costs to L.S. #21 (based on % of pump./transm. and % of L.S. #21 flow delivered to Broward County)	\$ 111,657.65	\$ 96,063.22
Calculation of Annual Admin and General Plant Costs Allocated to LBS (based on % of LBS flow to L.S. #21 flow)	\$ 26,481.30	\$ 23,315.77
Subtotal: L.S. #21 O&M Costs	\$ 134,827.98	\$ 147,926.65
Plus 25% Surcharge	\$ 33,706.99	\$ 36,981.66
Total L.S. #21 O&M Costs	\$ 168,534.97	\$ 184,908.31
Unit Cost	\$ 0.756	\$ 0.912
Total Volume Costs (sum of wastewater treatment costs plus L.S. #21 O&M costs)	\$ 517,558.74	\$ 578,841.45
Total ACTUAL Annual Cost to LBS (sum of availability costs plus volume costs)	\$ 552,423.56	\$ 613,706.27
UNIT COST	\$ 2.321	\$ 2.010
Actual Revenues from LBS	\$ 531,788.01	\$ 561,829.95
Additional Payment/(Credit) to be applied to following fiscal year	\$ 20,635.55	\$ 51,876.32



UTILITIES ADMINISTRATION

A. RANDOLPH BROWN
Director

1205 N.E. 5th Avenue
Pompano Beach, Florida 33060



Phone: 954-545-7043

City of Pompano Beach, Florida

Fax: 954-545-7046

December 13, 2011

Mr. Gerald Bryan, Finance Director
Town of Lauderdale by the Sea
4501 Ocean Drive
Lauderdale by the Sea, FL 33308

SUBJECT: Annual Rate Adjustment

Dear Mr. Haag:

The Wastewater Service Agreement between the City of Pompano Beach and the Town of Lauderdale by the Sea stipulates an annual recalculation of the monthly and volumetric rates. Enclosed for your review is a memo from our rate consultant, Raftelis Financial Consultants Inc., outlining the recalculation of the rate for the 2012 calendar year.

Your rates for calendar year 2012 will be:

\$ 26,563.34 monthly charge
\$ 2.052 volumetric rate per 1,000 gallons

The fiscal year 2012 monthly amount will be implemented effective with your January 1, 2012 billing.

Once you have had time to review the Raftelis memo, please let me know if you have any questions. I'd be glad to set up a phone conference with our consultant, if necessary, to review the calculations.

Sincerely,

A. Randolph Brown,
Utilities Director

- C: Ms. Connie Hoffmann, Town Manager
Mr. Ralph 'Bud' Bentley, Assistant Town Manager
Ms. Suzette Sibble, Finance Director
Mr. Kyle McPhail, Customer Service Manager
Mr. Dennis Beach, City Manager



RAFTELIS FINANCIAL
CONSULTANTS, INC.

1031 S. Caldwell Street • Suite 100
Charlotte • North Carolina • 28203

Phone 704 • 373 • 1199
Fax 704 • 373 • 1113

www.raftelis.com

Date December 13, 2011

To: Randy Brown, Utilities Director, City of Pompano Beach
From: Lex Warmath, Vice President, Raftelis Financial Consultants, Inc.

Re: 2012 Calculation of Wholesale Wastewater Treatment Rate for Lauderdale-by-the-Sea

The City of Pompano Beach (“City”) and the Town of Lauderdale-by-the-Sea (“LBS”) have entered into a fifteen-year contract whereby the City will continue to provide wastewater transmission and treatment services (“wholesale services”) to LBS. The current fee structure for the wholesale services includes a monthly fixed component of \$24,267.20 and a volumetric rate component of \$1.917 per 1,000 gallons of usage. These rates and charges were implemented beginning January 1, 2011.

Using the City’s FY 2012 budget, the updated treatment rates provided by Broward County, and the true-up from FY 2011, the new LBS rates and charges for calendar year 2012, to be implemented beginning January 1, 2012, include a monthly fee of **\$26,563.34** and a volumetric rate of **\$2.052** per 1,000 gallons. A summary of this calculation is provided in the schedules attached to this memorandum, as well as a comparison of the rate calculations for 2011 and 2012. As shown in the comparison, the proposed monthly and volumetric components are higher for 2012 due to several factors affecting the rates, both positive and negative, including the following:

Fixed Charge Components

- Broward County’s reserved capacity charge decreased by 2.2% and the True-up charge for Broward County also decreased.
- The true-up component reflects the difference in the total amount LBS paid to the City based on the rates and fixed charges in place for FY 2011 compared to the actual costs incurred by the City to serve LBS. The amount of this true-up increased significantly, from \$51,876.32 to \$85,856.08, an increase of 65.5%, or \$33,979.76. The primary reason for this change is that actual flows for FY 2011 were significantly different from the estimated flow levels used to allocate costs and calculate the rates for 2011. As previously identified and discussed with LBS, total flows measured for lift station #12 during FY 2010 were significantly lower than measured in previous years. Since LBS flows remained relatively consistent, the proportion of total flows at LS #12 attributable to LBS would have increased significantly, with a corresponding increase in the proportion of costs allocated to LBS. This approach would have been consistent with the contract which indicates LBS’s costs should be allocated in

proportion to LBS's use of LS #12. However, since this information was based on a new metering system, there was some concern about using the new information until it could be verified over time. As a result, estimated flow data more consistent with historical usage patterns was used to allocate costs and calculate the volumetric rate for 2011.

Based on the most recent data, both the level of total flows going through LS #12 and the flows attributable to LBS have been shown to be consistent with the prior year's data, indicating that the new meter is providing accurate information. The true-up calculation for FY 2011 has been adjusted to reflect this most recent year of actual flow data, and as a result, the proportion of costs associated with the operation and maintenance of LS #12 allocated to LBS have increased significantly compared to the estimated costs used to develop the volumetric rate for 2011, which was based on estimated flow data. As a result, there was a significant under-recovery of the true costs to serve LBS during FY 2011.

In future years, more moderate true-up amounts would be expected as long as the flow data remains reasonably consistent from year to year. The use of actual data from this point forward is consistent with LBS's request to avoid using estimated flow data whenever possible. In addition, using actual data for LS #12 allows costs allocated to LBS to be in proportion to LBS's use of LS #12, which is consistent with the contract.

- As a result, the total monthly fixed charge component has increased by approximately \$2,300 per month, or 9.5%.

Volumetric Charge Component

- Treatment rates charged by Broward County beginning October 1, 2011 decreased from \$0.886 to \$0.829 per 1,000 gallons, a decrease of 5.30%.
- In addition, in the last year's rate calculation, the IR&R component of the Broward County Rate was incorrectly estimated by using \$0.050, rather than applying a 5% IR&R factor, which would have produced a slightly lower IR&R component. This error has been corrected for 2012, and as a result, the total Broward County Rate dropped from \$0.936 to \$0.881, a decrease of approximately 5.9%.
- Budgeted operation and maintenance costs for FY2012 for LS #12 showed moderate increases compared to the prior year. However, because the proportions of those costs allocated to LBS increased due to the shifts in the flow data previously discussed, the total cost allocated to LBS increased by approximately 19.9%. For this component of the cost allocation, as prescribed in the contract between the City and LBS, we used a three-year average for all the flow information including total LS #12 flows, flows from LBS, and total flows delivered to Broward County. This included two years of data from the new LS #12 flow meter. Those allocation factors may shift again next year once three years of data are available using the new flow meter, although the adjustment is expected to be smaller. As a result, even if the operating and maintenance costs attributable to LS #12 remain stable, the

amount of those costs allocated to LBS may increase again for 2013. This adjustment is unavoidable given the change in the measured flows in recent years.

- The City's projected pumping and administration and general expenses are anticipated to increase in FY 2011 due mainly to capital outlays.

The changes listed above result in a monthly fee of \$26,563.34 and a volumetric rate of \$2.052 per 1,000 gallons. Comparing these rates to the rates paid by LBS in 2011, LBS will experience an increase of approximately 9.5% in the monthly charge and 7.05% in the volumetric rate paid to the City for wastewater service.

Calculated 2012 Rate

	Fiscal Year
	2012 (1)
	Projected
I. Fixed Charge Components - Annual Cost	
Availability Charge:	
Lift Station #12	\$ 17,922.57
A1A Force Main	16,942.25
Broward County Reserved Capacity Charge	197,858.43
Broward County True-Up Charge (prior year)	180.78
LBS True-up from Prior Year	85,856.08
Subtotal: Fixed Annual Charges	\$ 318,760.11
Calculated Monthly Charge	
	\$ 26,563.34

II. Volumetric Charge Components - Annual Cost	
Lift Station #12 Costs: (1)	
LS #12 Electrical	\$ 13,254.00
LS #12 Chemical	95,143.46
LS #12 Personnel Pumping	48,131.36
LS #12 Other Pumping	13,604.48
LS #12 Admin. & General Expense	20,582.94
Subtotal	\$ 190,716.24
Plus 25% Surcharge	47,679.06
Subtotal: LS #12 Costs	\$ 238,395.30
Estimated Flow (in kgal)	203,604
LS #12 Volumetric Rate (\$/kgal)	\$ 1.171
Broward County Rate	\$ 0.839
Plus: IR&R Charge of 5%	\$ 0.042
Subtotal: Broward County Rate (\$/kgal)	\$ 0.881
Total Volumetric Rate per 1,000 gallons (2)	
	\$ 2.052

Total Projected Annual Cost (2)	\$ 736,520.35
Total Projected Monthly Cost	\$ 61,376.70
Total Annual Cost converted to a Volumetric Rate	\$ 3.617
(For comparison purposes only.)	

- (1) Based on budgeted costs for FY 2012
- (2) Due to rounding, the total volumetric rate times the estimated flow plus the annual fixed charges might be slightly different than the total projected annual cost shown.

Comparison

	Fiscal Year		% Change
	2011	2012 (1)	
	Projected	Projected	
I. Fixed Charge Components - Annual Cost			
Availability Charge:			
Lift Station #12	\$ 17,922.57	\$ 17,922.57	
A1A Force Main	16,942.25	16,942.25	
Broward County Reserved Capacity Charge	202,374.59	197,858.43	-2.23%
Broward County True-Up Charge (prior year)	2,090.71	180.78	-91.35%
LBS True-up from Prior Year	51,876.32	85,856.08	65.50%
Subtotal: Fixed Annual Charges	\$ 291,206.43	\$ 318,760.11	9.46%
Calculated Monthly Charge	\$ 24,267.20	\$ 26,563.34	9.46%
II. Volumetric Charge Components - Annual Cost			
Lift Station #12 Costs: (1)			
LS #12 Electrical	\$ 9,490.97	\$ 13,254.00	
LS #12 Chemical	66,359.01	95,143.46	
LS #12 Personnel Pumping	35,082.71	48,131.36	
LS #12 Other Pumping	13,985.00	13,604.48	
LS #12 Admin. & General Expense	34,125.66	20,582.94	
Subtotal	\$ 159,043.35	\$ 190,716.24	19.91%
Plus 25% Surcharge	39,760.84	47,679.06	
Subtotal: LS #12 Costs	\$ 198,804.19	\$ 238,395.30	19.91%
Estimated Flow (in kgal)	202,713	203,604	
LS #12 Volumetric Rate (\$/kgal)	\$ 0.981	\$ 1.171	19.39%
Broward County Rate	\$ 0.886	\$ 0.839	-5.30%
Plus: IR&R Charge of 5%	\$ 0.050	\$ 0.042	
Subtotal: Broward County Rate (\$/kgal)	\$ 0.936	\$ 0.881	-5.88%
Total Volumetric Rate per 1,000 gallons (2)	\$ 1.917	\$ 2.052	7.05%
Total Projected Annual Cost (2)	\$ 679,749.98	\$ 736,520.35	8.35%
Total Projected Monthly Cost	\$ 56,645.83	\$ 61,376.70	
Total Annual Cost converted to a Volumetric Rate (For comparison purposes only.)	\$ 3.353	\$ 3.617	

(1) Based on budgeted costs for FY 2012

(2) Due to rounding, the total volumetric rate times the estimated flow plus the annual fixed charges might be slightly different than the total projected annual cost shown.

A. Availability Costs (Fixed Costs)

		Allocation Percentage		FY 2010	FY 2011
1) Lift Station #12					
Total Construction Costs	\$ 964,829				
% Allocated to LBS	\$ 241,207	25.0%			
Annual Debt Service Payment					
Annual Cost to LBS				\$17,922.57	\$17,922.57
Monthly Cost to LBS				\$1,493.55	\$1,493.55
2) A1A Force Main					
Total Construction Costs	\$ 542,331				
% Allocated to LBS	\$ 271,166	50.0%			
Annual Debt Service Payment					
Annual Cost to LBS				\$16,942.25	\$16,942.25
Monthly Cost to LBS				\$1,411.85	\$1,411.85
Total Availability Costs to LBS					
Annual Cost				\$34,864.82	\$34,864.82
Monthly Cost				\$2,905.40	\$2,905.40
Unit Cost (For comparison purposes only)				\$ 0.1720	\$ 0.1884

B. Cost per 1,000 Gallons (Volume Costs)

		2010	2011
Actual Flow/Usage Data:			
Total LBS annual flow (kgals)		202,713	185,071
Total flow from L.S. #12 (kgals)		835,197	402,409
Total flow delivered to Broward County (kgals)		4,627,160	4,496,220
% of annual LBS flow to annual L.S. #12 flow		24.27%	45.99%
% of annual L.S. #12 flow to total annual flow delivered to Broward County		18.05%	8.95%
% of annual LBS flow to total annual flow delivered to Broward County		4.38%	4.12%
1) Wastewater Treatment Cost to LBS			
A. Broward County Rate (\$/kgals treated)			
IR&R Factor		\$ 0.7950	\$ 0.8860
		\$ 0.0500	\$ 0.0440
	Total Unit Cost	\$ 0.8450	\$ 0.9300
Annual Cost to LBS (plus IR&R Factor)		\$ 171,292.49	\$ 172,116.03
B. Reserved capacity for LBS 1.25 MGD			
Wastewater Treatment Debt Service (\$/mo/MGD reserved)		\$ 12,561.44	\$ 12,849.18
Annual Cost to LBS (plus IR&R Factor)		\$ 197,842.70	\$ 202,374.59
Unit Cost (For comparison purposes only)		\$ 0.9780	\$ 1.0935
C. Broward County True-Up Charge for prior year (Includes IR&R Factor)			
% Allocation based on LBS actual flow to total flow delivered to Broward County, from prior year		5.06%	4.38%
Annual Cost Allocated to LBS		\$ 24,797.96	\$ 2,090.71
Unit Cost (For comparison purposes only)		\$ 0.1223	\$ 0.0113
Total Wastewater Treatment Cost to LBS		\$ 393,933.14	\$ 376,581.32
Unit Cost (For comparison purposes only)		\$ 1.0983	\$ 1.1048

	2010	2011
2) Lift Station #12 O&M Costs		
A. Total Pumping Electrical Costs	\$ 325,252.09	\$ 331,209.49
L.S. #12 Electrical & Water Costs	\$ 35,427.77	\$ 35,670.29
% of L.S.#12 electrical pumping costs to total electrical pumping costs	10.89%	10.77%
Calculation of Annual Electrical Costs Allocated to LBS (based on % of LBS flow to L.S. #12 flow)	\$ 8,598.77	\$ 16,405.04
B. L.S. #12 Chemical Costs	\$ 301,927.99	\$ 272,540.94
Calculation of Annual Chemical Costs Allocated to LBS (based on % of LBS flow to L.S. #12 flow)	\$ 73,281.79	\$ 125,343.68
C. Personnel Pumping Costs		
Pumping Personnel Costs	\$ 919,346.21	\$ 951,940.40
Pumping Internal Services	\$ 281,479.00	\$ 345,626.00
Total Personnel Pumping Costs	\$ 1,200,825.21	\$ 1,297,566.40
% of L.S.#12 electrical pumping costs to total electrical pumping costs	10.89%	10.77%
Allocation of Personnel Pumping Costs to L.S. #12	\$ 130,798.73	\$ 139,744.09
Calculation of Annual Personnel Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #12 flow)	\$ 31,746.52	\$ 64,269.39
D. Other Pumping Expenses	\$ 250,718.69	\$ 294,342.29
Allocation of Other Pumping Expenses to L.S. #12 (based on % of L.S. #12 flow delivered to Broward County)	\$ 45,254.43	\$ 26,343.46
Calculation of Annual Other Pumping Costs Allocated to LBS (based on % of LBS flow to L.S. #12 flow)	\$ 10,983.83	\$ 12,115.56
E. Sewer Admin and General Plant Expenses		
Sewer Admin	\$ 911,059.66	\$ 940,758.74
General Plant Expense	\$ 207,933.21	\$ 169,895.00
Total Sewer Admin and General Plant Expenses	\$ 1,118,992.87	\$ 1,110,653.74
Total Pumping Expenses	\$ 1,939,833.86	\$ 2,021,026.28
Total Transmission Exp.	\$ 2,138,748.72	\$ 2,001,849.18
Total Pumping & Transmission Expenses	\$ 4,078,582.58	\$ 4,022,875.44
% of pumping expenses to transmission expenses	47.56%	50.24%
Allocation of Admin/Gen. Plant Costs to L.S. #12 (based on % of pump./transm. and % of L.S. #12 flow delivered to Broward County)	\$ 96,063.19	\$ 49,938.35
Calculation of Annual Admin and General Plant Costs Allocated to LBS (based on % of LBS flow to L.S. #12 flow)	\$ 23,315.77	\$ 22,967.03
Subtotal: L.S. #12 O&M Costs	\$ 147,926.68	\$ 241,100.70
Plus 25% Surcharge	25.0%	\$ 60,275.17
Total L.S. #12 O&M Costs	\$ 184,908.35	\$ 301,375.87
Unit Cost	\$ 0.912	\$ 1.628
Total Volume Costs (sum of wastewater treatment costs plus L.S. #12 O&M costs)	\$ 578,841.49	\$ 677,957.19
Total ACTUAL Annual Cost to LBS (sum of availability costs plus volume costs)	\$ 613,706.31	\$ 712,822.01
UNIT COST	\$ 2.010	\$ 2.733
Actual Revenues from LBS	\$ 561,829.95	\$ 626,965.93
Additional Payment/(Credit) to be applied to following fiscal year	\$ 51,876.36	\$ 85,856.08



Appendix “K”
Flow Meter Maintenance Logs
Total Pages 7

PC CONTROLS INC

INVOICE

NO. PCI209387	DATE: 12/09/09
TERMS NET 30	

ORDER # 9683	CUST. #	SHIP VIA:
S O L D T O	Lauderdale-by-the-Sea Accounts Payable 4501 Ocean Dr Lauderdale-by-the-Sea FL 33308	S H I P T O Don Prince Pumping Station

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
1	lot	12/3/09 Thursday - Delivered to site Rosemount Magmeter - Seagrape Lift station Rosemount Magnetic Flowtube & remote Transmitter Model 8750WA, 14" Submersible with 50' cable and 8714 Internal meter verification option. Carbon Steel tube with liner. Note: Freight charges were passed directly with no type of mark up and was referenced that they would be added to the final invoice on the quote. Gross weight of LTL/Truck delivery: 370 lbs	\$6,779.00	\$6,779.00

REMIT TO:
P.C.Controls, Inc.
132 NE 30th Street
Wilton Manors, FL
33334-1065

COMMENTS:

SUB-TOTAL	\$6,779.00
TAX	\$0.00
BALANCE	\$6,779.00
FREIGHT	\$391.16
TOTAL DUE	\$7,170.16

Phone - 954 568-9663 Fax - 954 563-0919 Email - pccontrolsinc@bellsouth.net

PC CONTROLS INC

INVOICE

NO. PCI209388	DATE: 12/09/09
TERMS NET 30	

ORDER # 9669	CUST. #	SHIP VIA:
S O L D T O	Lauderdale-by-the-Sea Accounts Payable 4501 Ocean Dr Lauderdale-by-the-Sea FL 33308	Don Prince Pumping Station

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
1	lot	12/8/09 Tuesday Installation of new Rosemount Magmeter (Flow Tube and Transmitter) at the Sea Grape Liftstation. Test and put into service.	\$5,280.00	\$5,280.00

REMIT TO:
P.C.Controls, Inc.
132 NE 30th Street
Wilton Manors, FL
33334-1065

COMMENTS:

SUB-TOTAL	\$5,280.00
TAX	\$0.00
BALANCE	\$5,280.00
FREIGHT	\$0.00
TOTAL DUE	\$5,280.00

Phone - 954 568-9663 Fax - 954 563-0919 Email - pccontrolsinc@bellsouth.net

PC CONTROLS INC

INVOICE

NO.	PCI210180	DATE:	06/23/10
TERMS	NET 30		

ORDER #	PO 100128	CUST. #		SHIP VIA:
S O L D T O	City of Pompano Beach Accounts Payable PO Drawer 1300 Pompano Beach	FL	33061	Waste Water Treatment Plant Bobbie Clayton

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
8	hours	6/17/10 Thursday Technician Calibrate and certify Liftstation 86 - Level (bubbler) Transmitter and Pump 3 flowmeter. Pumps 2 & 4 down. Calibrate and Certify all associated chart recorders. Calibrate and Certify Liftstation 61 - Pump 1 and Pump 2 Flowmeters. Pump 3 down.	\$59.00	\$472.00
8	hours	6/22/10 Tuesday Technician Finish calibration and certification of Liftstation 61. Calibrate and certify Level (bubber) transmitter. Calibrate and Certify all associated chart recorders. Calibrate and Certify Liftstation 12 - Flow and Pressure transmitters. Calibrate and Certify all associated chart recorders. During calibrations - Flowmeter removed and cleaned - Pressure transmitter removed / drained of and replace pressure ports. Check operation and calibration of LBTS lift station flowmeter.	\$59.00	\$472.00
7	each	Transmitter Certification fee	\$49.00	\$343.00
2	each	Pressure port	\$10.00	\$20.00

REMIT TO:
P.C.Controls, Inc.
132 NE 30th Street
Wilton Manors, FL
33334-1065

COMMENTS:

SUB-TOTAL	\$1,307.00
TAX	\$0.00
BALANCE	\$1,307.00
FREIGHT	\$0.00
TOTAL DUE	\$1,307.00

Phone - 954 568-9663 Fax - 954 563-0919 Email - pccontrolsinc@bellsouth.net

PC CONTROLS INC

INVOICE

NO.	PCI210329	DATE:	11/02/10
TERMS	NET 30		

ORDER #	PO 110128	CUST. #	SHIP VIA:
S O L D T O	City of Pompano Beach Accounts Payable PO Drawer 1300 Pompano Beach	FL 33061	Waste Water Pumping Bobbie Clayton

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
5	hours	11/1/10 Monday Technician Calibrate & certiv Pompano Influent to Broward County. Calibrate and certify LBTS Lift station flowmeter.	\$59.00	\$295.00
2	each	Transmitter Certification Fee	\$49.00	\$98.00

REMIT TO:
P.C.Controls, Inc.
132 NE 30th Street
Wilton Manors, FL
33334-1065

COMMENTS:

SUB-TOTAL	\$393.00
TAX	\$0.00
BALANCE	\$393.00
FREIGHT	\$0.00
TOTAL DUE	\$393.00

Phone - 954 568-9663 Fax - 954 563-0919 Email - pccontrolsinc@bellsouth.net



P.C. Controls Inc
 132 NE 30th Street, Wilton Manors, FL 33334
 Phone: (954) 568-9663, Fax: (954) 563-0919
 E-mail: pccontrolsinc@bellsouth.net

Certified Flow Meter Test Record

Customer: Lauderdale-by-the-Sea
 Consumptive Use Permit # _____
 Test Site Lift Station Flow Transmitter District ID# _____
 Contact Bill Mason Number 954 776-0576
 Meter Model Rosemount 8712 Serial# 870180980
 Meter Accessories: None

Pipe Information at test site

Material Ductile Iron
 Outside Diameter 15.3" OD Pipe Thickness .39" WT
 Transducer Spacing 6.51" Z-mount Distance from Meter installation is 1 foot

Test Information using Fuji Porta-Flow Portable Ultrasonic Flowmeter

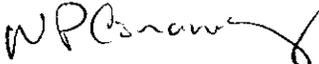
Test performed @ _____ 1756 _____ GPM
 Initial Meter Reading at Calibration Start: 181450 X 1000 End: 181463 X 1000
13,000 Gallons Totalized in 443 Seconds Average 1760 GPM
 Test Meter Reading at Calibration Start: 0 X 1 End: 13000 X 1
13,000 Gallons Totalized in 444 Seconds Average 1756 GPM
 Meter Tested at 100.2 % Accuracy Last Meter Test N/A Last Accuracy _____

Comments:

Performed By: CJN

Date: 11/1/10

This is to certify that the above listed equipment has been calibrated and meets or exceeds all published specifications. Calibration was performed using standards and/or instrumentation whose accuracy is traceable to the N.I.S.T.

Signature : 

PC CONTROLS INC

INVOICE

NO. PCI211195	DATE: 05/17/11
TERMS NET 30	

ORDER #	PO 110128	CUST. #	SHIP VIA:
S O L D T O	City of Pompano Beach Accounts Payable PO Drawer 1300 Pompano Beach FL 33061		Waste Water Pumping Bobbie Clayton

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
5	hours	5/16/11 Monday Technician Calibrate & certify Pompano Influent to Broward County. Clean Flowmeter at Lift station 12. Calibrate flowmeter at LBTS Lift station.	\$59.00	\$295.00
1	each	Transmitter Certification Fee	\$49.00	\$49.00
1	each	Fuel Surcharge	\$10.00	\$10.00
<div style="border: 1px solid red; padding: 10px; margin: 10px auto; width: 80%;"> <p><i>LBTS - Flowmeter Calibration within tolerance - 4-20 mA output verified</i></p> </div>				
<div style="margin: 10px auto; width: 20%;"> <p><i>PCCI</i></p> </div>				

REMIT TO:
P.C.Controls, Inc.
132 NE 30th Street
Wilton Manors, FL
33334-1065

COMMENTS:

SUB-TOTAL	\$354.00
TAX	\$0.00
BALANCE	\$354.00
FREIGHT	\$0.00
TOTAL DUE	\$354.00

Phone - 954 568-9663 Fax - 954 563-0919 Email - pcccontrolsinc@bellsouth.net

PC CONTROLS INC

INVOICE

NO.	PCI211195	DATE:	05/17/11
TERMS	NET 30		

ORDER #	PO 110128	CUST. #	SHIP VIA:
S O L D T O	City of Pompano Beach Accounts Payable PO Drawer 1300 Pompano Beach FL 33061	S H I P T O	Waste Water Pumping Bobbie Clayton

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
5	hours	5/16/11 Monday Technician Calibrate & certify Pompano Influent to Broward County. Clean Flowmeter at Lift station 12. Calibrate flowmeter at LBTS Lift station.	\$59.00	\$295.00
1	each	Transmitter Certification Fee	\$49.00	\$49.00
1	each	Fuel Surcharge	\$10.00	\$10.00

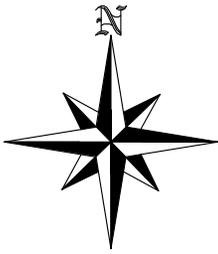
REMIT TO:
P.C.Controls, Inc.
132 NE 30th Street
Wilton Manors, FL
33334-1065

COMMENTS:

SUB-TOTAL	\$354.00
TAX	\$0.00
BALANCE	\$354.00
FREIGHT	\$0.00
TOTAL DUE	\$354.00

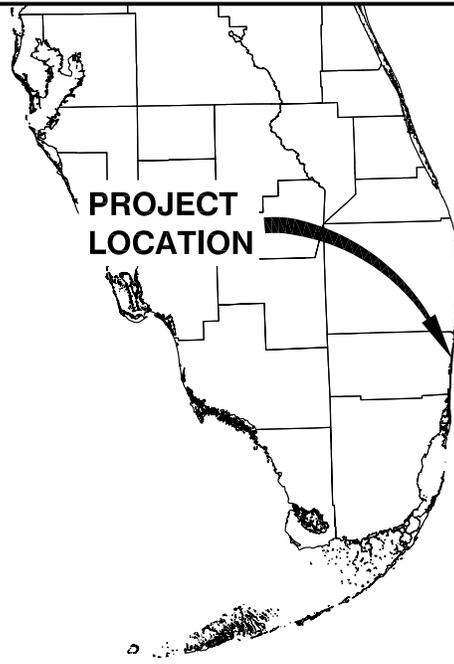


Appendix “L”
Lift Station Vicinity Maps
Total Pages 2



SEC. 18, TWP. 49 So., RNG. 43 E.

LATITUDE; 26° 11' 06.83" N
 LONGITUDE; 80° 05' 58.37" W



PROJECT LOCATION

BROWARD COUNTY VICINITY MAP

PROJECT LOCATION

INTRACOASTAL WATERWAY



ATLANTIC OCEAN

HIBISCUS LIFT STATION - LS 25 (2)

PLAN
LOCATION MAP



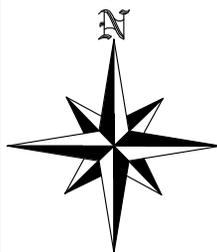
4501 OCEAN DRIVE
 LAUDERDALE-BY-THE-SEA
 FLORIDA 33308
 954-776-0576
www.lauderdalebythesea-fl.gov



8390 NW 53rd Street, Suite 200
 Doral, Florida 33166
 Phone: 305-392-9979
 Fax: 305-392-9912
www.Kingengineering.com
 Engineering License #2610

JOB NO.
4777-000-001
 DATE:
DEC. 2011

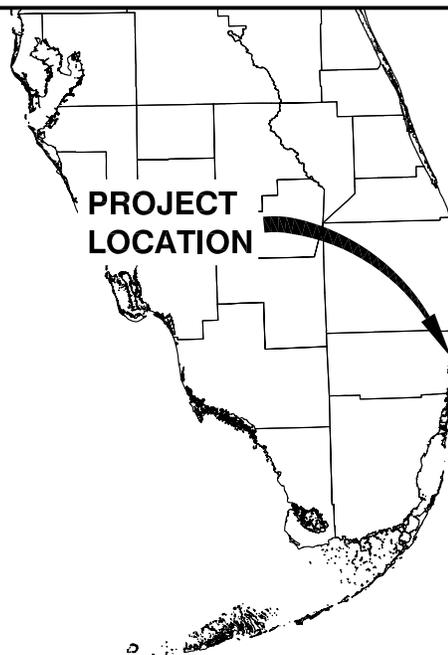
APPENDIX
L



SEC. 18, TWP. 49 So., RNG. 43 E.

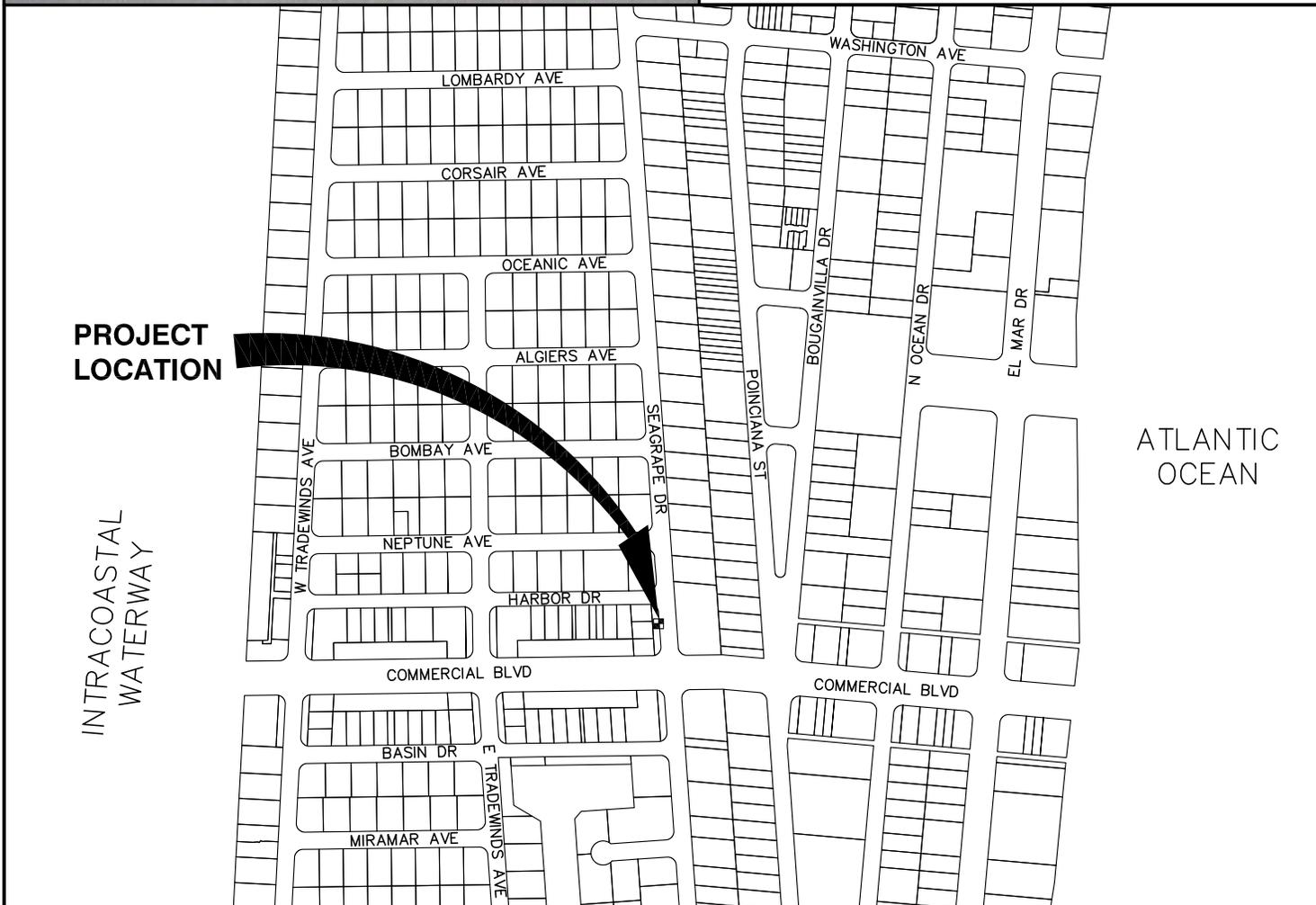
LATITUDE; 26° 11' 25.27" N

LONGITUDE; 80° 05' 55.22" W



PROJECT LOCATION

BROWARD COUNTY VICINITY MAP



PROJECT LOCATION

INTRACOASTAL WATERWAY

ATLANTIC OCEAN

SEAGRAPE LIFT STATION - LS 24 (2)

PLAN
LOCATION MAP



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Doral, Florida 33166
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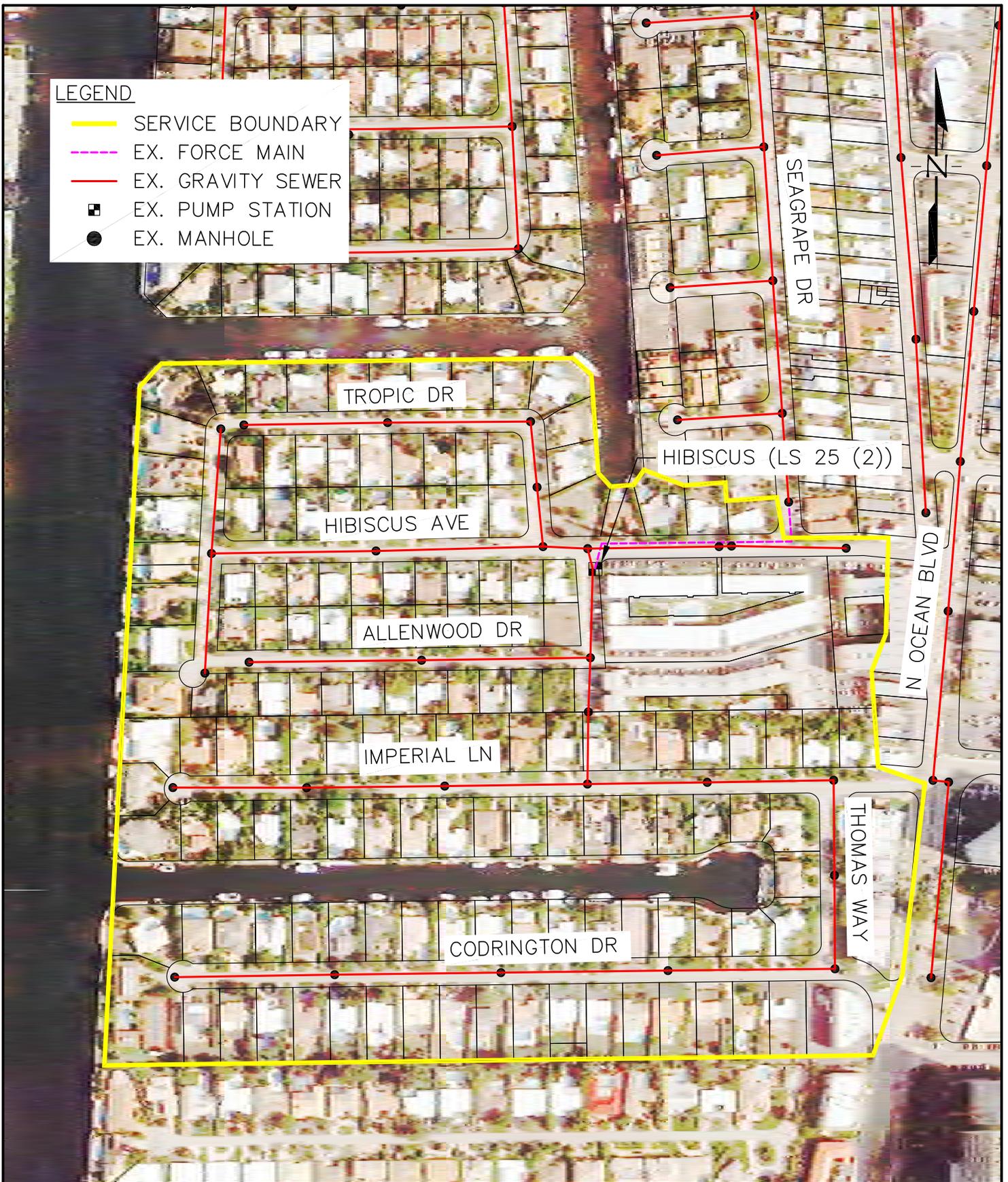
JOB NO.
4777-000-001
DATE:
DEC. 2011

APPENDIX
L



Appendix "M"

Lift Station Service Area and Flow Diagram Maps
Total Pages 2



LEGEND

- SERVICE BOUNDARY
- EX. FORCE MAIN
- EX. GRAVITY SEWER
- ▣ EX. PUMP STATION
- EX. MANHOLE

HIBISCUS LIFT STATION - LS 25 (2)

PLAN
SERVICE AREA MAP



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JOB NO.
4777-000-001

APPENDIX

M

DATE:
DEC. 2011



- LEGEND**
- SERVICE BOUNDARY
 - EX. FORCE MAIN
 - EX. GRAVITY SEWER
 - EX. PUMP STATION
 - EX. MANHOLE

SEAGRAPE LIFT STATION - LS 24 (10)

PLAN
SERVICE AREA MAP



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JOB NO.
4777-000-001

APPENDIX

M

DATE:
DEC. 2011



Appendix “N”
Lift Station Inspection Photographs
Total Pages 3



HIBISCUS LIFT STATION - LS 25 (2)



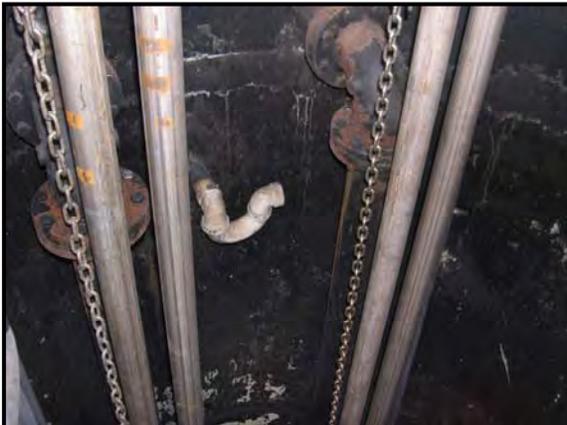
Hibiscus Lift Station – LS 25 (2)



Control Panel



Wet Well



LS Rails and Discharge Piping



Electrical Components



Valve Vault



SEAGRAPE LIFT STATION - LS 24 (10)



Control House



Wet Well Access Hatches



Control House and Wet Well



Damaged Soffit and Generator Exhaust



Wet Well



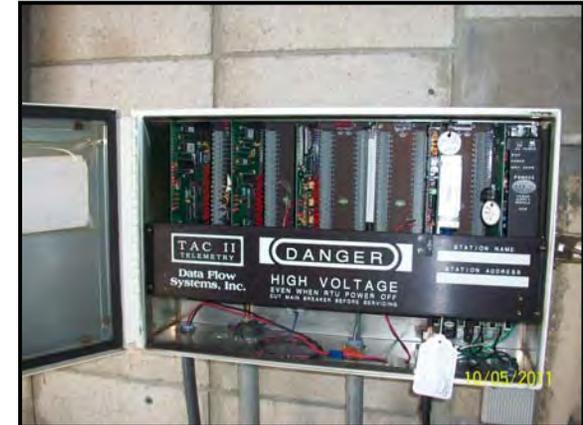
Electrical Wiring in Wet Well



Electrical Components



Control Panel



Telemetry System



Generator



Check and Plug Valves



Check and Plug Valves



Appendix "O"

Lift Station Hydraulic Calculations
Total Pages 2

**HYDRAULIC CALCULATIONS
HIBISCUS LIFT STATION - LS 25 (2)**

Pump Station Piping (Minor Losses)

Pipe Diameter (in) **4** Area (sq ft) 0.0873
 Pipe Length (ft) **18**
 C-Factor **100**

Fittings	Quantity	K value	Total K
90 el	2	0.40	0.80
45 el	0	0.20	0.00
Tee (Branch)	0	0.90	0.00
Plug Valve	1	0.20	0.20
Check Valve	1	2.00	2.00
Exit Loss	0	1.00	0.00
Total			3.00

Flow (gpm)	V (ft/s)	Hf (ft)	Hv (ft)	Ht (ft)
0	0.0	0.0	0.0	0.0
50	1.3	0.1	0.1	0.1
75	1.9	0.1	0.2	0.3
100	2.6	0.2	0.3	0.5
200	5.1	0.8	1.2	2.0
300	7.7	1.7	2.7	4.4
400	10.2	2.9	4.9	7.7
500	12.8	4.3	7.6	11.9
600	15.3	6.1	10.9	17.0

Total Losses

PS Discharge EL **2.50** ft
 LWL EL **-10.83** ft
 Static Head **13.33** ft

 Tie-in Pressure **0.00** psig
 Tie-in Pressure **0.00** ft, at PS entrance

Headloss

Pipe Diameter (in) **6** Area (sq ft) 0.1963
 Pipe Length (ft) **558**
 C-Factor **100**

Fittings	Quantity	K value	Total K
90 el	1	0.40	0.40
45 el	1	0.20	0.20
Tee (Branch)	0	0.90	0.00
Plug Valve	0	0.20	0.00
Check Valve	0	2.00	0.00
Exit Loss	0	1.00	0.00
Total			0.60

Flow (gpm)	V (ft/s)	Hf (ft)	Hv (ft)	Ht (ft)
0	0.0	0.0	0.0	0.0
50	1.3	0.3	0.0	0.3
75	1.9	0.6	0.0	0.6
100	2.6	0.9	0.1	1.0
200	5.1	3.4	0.2	3.7
300	7.7	7.2	0.5	7.8
400	10.2	12.3	1.0	13.3
500	12.8	18.6	1.5	20.1
600	15.3	26.1	2.2	28.3

Pump Station Flow (gpm)	Minor Losses Ht (ft)	Static Head (ft)	Headloss (ft)	TDH (ft)
0	0.0	13.33	0.00	13.33
50	0.1	13.33	0.28	13.74
75	0.3	13.33	0.59	14.22
100	0.5	13.33	1.01	14.86
200	2.0	13.33	3.66	18.99
300	4.4	13.33	7.78	25.52
400	7.7	13.33	13.30	34.35
500	11.9	13.33	20.15	45.40
600	17.0	13.33	28.30	58.63

HYDRAULIC CALCULATIONS
SEAGRAPE LIFT STATION - LS 24 (10)

Minor Losses

Pipe Diameter (in)	12	Area (sq ft)	0.7854
Pipe Length (ft)	35		
C-Factor	100		

Fittings	Quantity	K value	Total K
90 el	2	0.40	0.80
45 el	0	0.20	0.00
Tee (Branch)	1	0.90	0.90
Plug Valve	1	0.20	0.20
Check Valve	1	2.00	2.00
Exit Loss	0	1.00	0.00

Total 3.90

Flow (gpm)	V (ft/s)	Hf (ft)	Hv (ft)	Ht (ft)
0	0.0	0.0	0.0	0.0
250	0.7	0.0	0.0	0.0
500	1.4	0.0	0.1	0.2
1000	2.8	0.1	0.5	0.6
1500	4.3	0.3	1.1	1.4
2000	5.7	0.5	1.9	2.5
2500	7.1	0.8	3.0	3.8
3000	8.5	1.1	4.4	5.5
3500	9.9	1.5	6.0	7.4

Total Losses

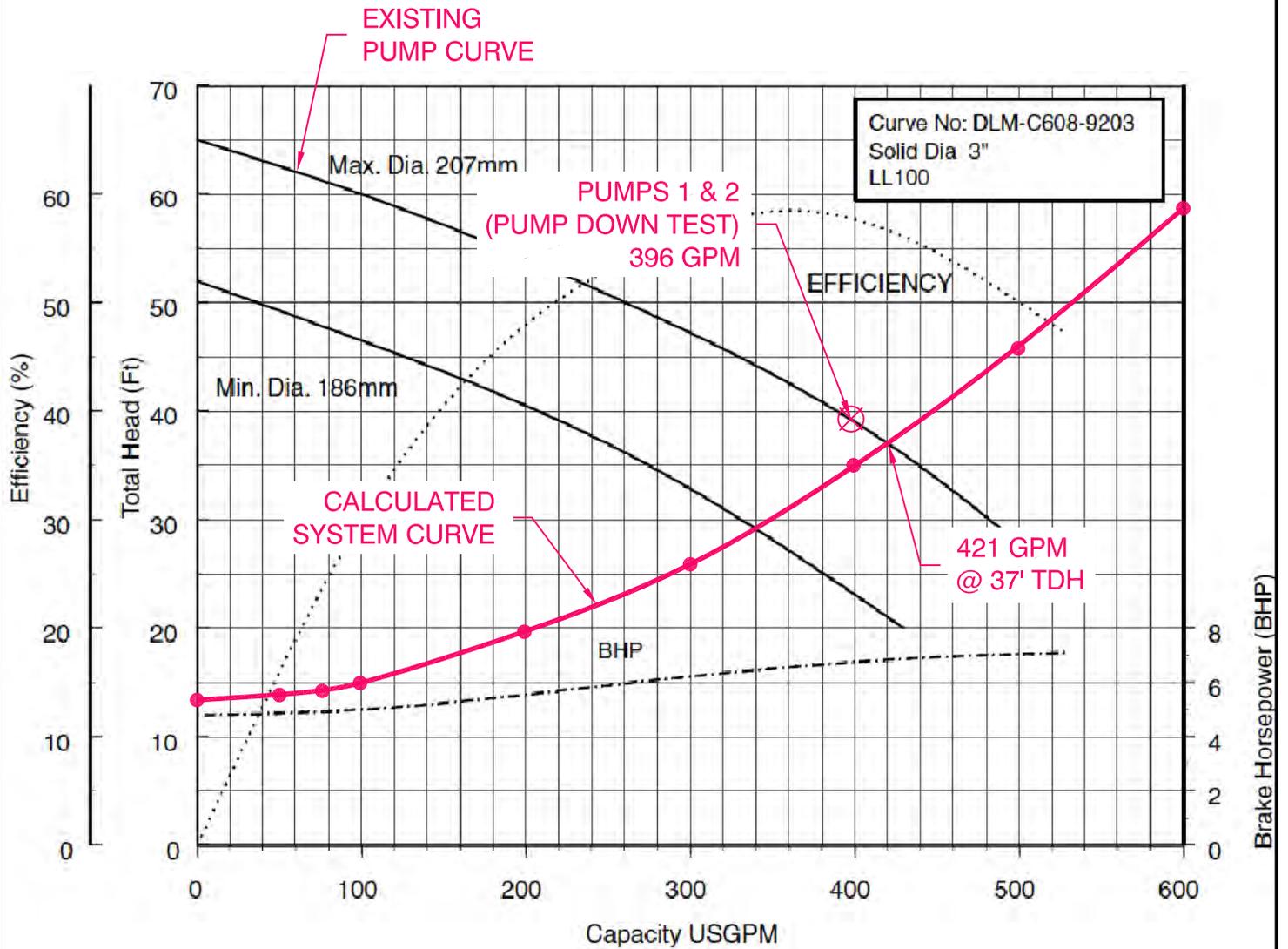
PS Discharge EL	2.12 ft
LWL EL	-14.37 ft
Static Head	16.49 ft
Minimum Tie-in Pressure	3.00 psig
Minimum Tie-in Pressure	6.92 ft, at PS entrance
Maximum Tie-in Pressure	35.00 psig
Maximum Tie-in Pressure	80.73 ft, at PS entrance



Appendix "P"

Existing Pump Curves
Total Pages 2

MODEL No. 100DLMF65.5 (7.5 HP)
 SYNCHRONOUS SPEED: 1800 RPM
 4-INCH DISCHARGE



HIBISCUS LIFT STATION - LS 25 (2)

PLAN

PUMP CURVE



4501 OCEAN DRIVE
 LAUDERDALE-BY-THE-SEA
 FLORIDA 33308
 954-776-0576
 www.lauderdalebythesea-fl.gov



8390 NW 53rd Street, Suite 200
 Doral, Florida 33166
 Phone: 305-392-9979
 Fax: 305-392-9912
 www.Kingengineering.com
 Engineering License #2610

JOB NO.

4777-000-001

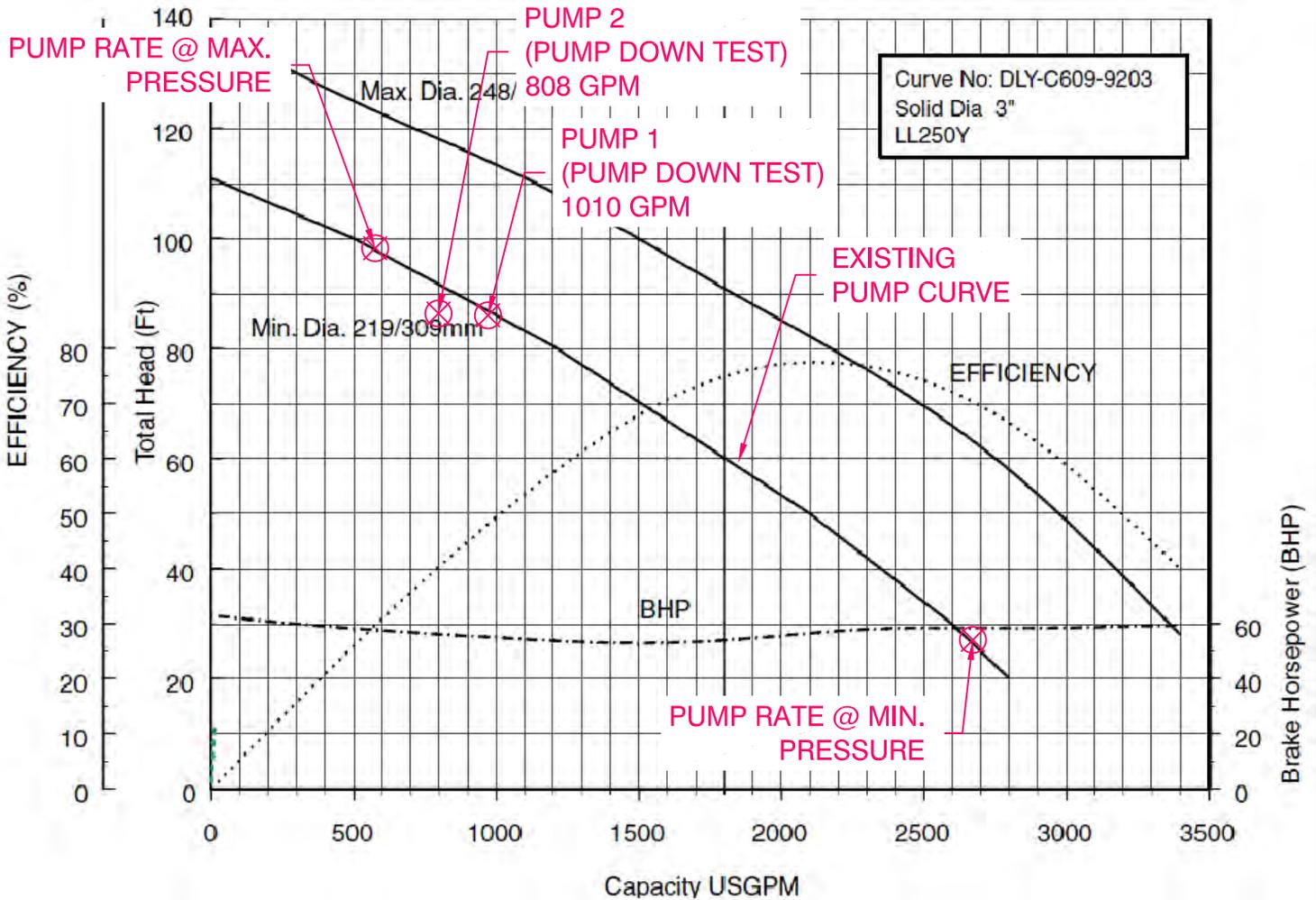
DATE:

DEC. 2011

APPENDIX

P

MODEL No. 250DLF645 (60 HP)
 SYNCHRONOUS SPEED: 1800 RPM
 10-INCH DISCHARGE



SEAGRAPE LIFT STATION - LS 24 (10)

PLAN

PUMP CURVE



4501 OCEAN DRIVE
 LAUDERDALE-BY-THE-SEA
 FLORIDA 33308
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8390 NW 53rd Street, Suite 200
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 Engineering License #2610

JOB NO.
 4777-000-001

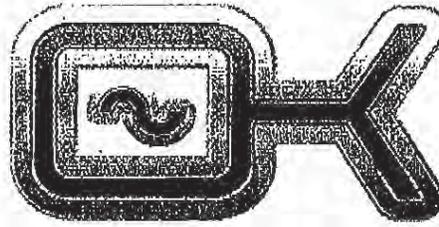
APPENDIX

DATE:
 DEC. 2011

P



Appendix “Q”
Generator Load Bank Test and Replacement Proposals
Total Pages 5



OK GENERATORS

To: Rick Diaz **From:** BOOKER /Service Department

Fax: 305-392-9912 **Date:** 12/5/2011

Phone: 786-316-1679 **Pages:** 1

Re: **CC:**

SHIP TO 373 n river Ave Deerfield Bch , Fl 33441

Urgent **For Review** **Please Comment** **1 Please Reply** **Please**

Recycle

Quote for a Load bank 100kw for NO-S/A
 2hr \$ 900.00
 4hr \$ 1050.00



Quotation

CUMMINS POWER SOUTH LLC
 9900 NW 77th. Court
 Hialeah Gardens FL 33016 United States
 Direct: 305-824-4632

November 30, 2011

King Engineering
Rick Diaz
305-392-9912

Project Name: Replacement 100KW

Quotation: 1574000000144469

Thank you for your inquiry. We are pleased to quote as follows:

		USD
Item	Description	Qty
	Diesel Genset: 60Hz-100kW	
Install-US-Stat	U.S. EPA, Stationary Emergency Application	1
100DSGAA	Genset-Diesel,60Hz,100kW	1
A331-2	Duty Rating-Standby Power	1
L090-2	Listing-UL 2200	1
L169-2	EmissionCert,EPA,Tier 3,NSPS CI Stationary Emergency	1
R002-2	Voltage-277/480,3 Phase,Wye,4 Wire	1
B415-2	Alternator-60 Hz, 12 Lead, Upper Broad Range, 105C	1
H702-2	GENSET CONTROL-POWERCOMMAND 2.2	1
B184-2	Exciter/Regulator-Pmg, 3 Phase Sensor	1
A366-2	Engine Governor-Electronic, Isochronous Only	1
H536-2	Display Language-English	1
H609-2	Control Mounting-Left Facing	1
A362-2	Heater-Control Cabinet,120VAC	1
K631-2	Relays-Genset Status, User Configured	1
K796-2	Stop Switch-Emergency	1
KS53-2	Signals - Auxiliary, 8 Inputs/8 Outputs	1
A292-2	Heater-Alternator, 120 Volt AC	1
KP81-2	Circuit Breaker Or Entrance Box-Right & Left Side	1
KT67-2	CircuitBreaker-100A,Left,3P,600/525V,TM,80%UL/IEC	1
KT66-2	CircuitBreaker-100A,Right,3P,600/525V,TM,80%UL/IEC	1
KM73-2	Shunttrip-12vdc,Dual Breakers	1

L163-2	Listing, ULC-S601-07	1
C259-2	Fuel Tank-Dual Wall Subset, 500 Gallon Capacity	1
C127-2	Separator-Fuel/Water	1
0541-1462	External Fill w/ Over Fill Prevention Valve (OFFV) Kit	1
H674-2	Warning-Fuel in Rupture Basin	1
H645-2	Warning-Low Fuel Level	1
A422-2	Engine Starter - 12 VDC Motor	1
A333-2	Battery Charging Alternator-Normal Output	1
E125-2	Engine Cooling-High Ambient Air Temperature	1
H389-2	Shutdown-Low Coolant Level	1
E089-2	Extension-Engine Coolant Drain	1
F013-2	Duct Adaptor-Radiator Outlet	1
H669-2	Engine Coolant-50% Antifreeze, 50% Water Mixture	1
H036-2	Coolant Heater-120 Volt Ac, Single Phase	1
D036-2	Engine Air Cleaner-Heavy Duty	1
A299-2	Exhaust Connector-NPT	1
H706-2	Engine Oil	1
L026-2	Test Record-Certified	1
L031-2	Genset Warranty- Standby Comprehensive Extended, 5 Years / 1,500 Hours	1
L050-2	Literature-English	1
A322-2	Packing-Skid, Poly Bag	1
F066-2	Rack-Battery	1
H268-2	Extension-Oil Drain	1
CP01-2	Common Parts Listing	1
SPEC-G	Product Revision - G	1
0402-0690-15	Isolator Pkg-Qty 4-1300#-Not w/159-1486/1512 Tanks	4
NRG22-10-RC	SENS 10 AMP Dual Voltage	1
ST120SN3RSL	E STOP BRK Glass GEN W/CONTACT (3 items)	1
Delivery Option 3	Factory Direct Shipment to Customer	1

Grand Total \$36,203.57

(check appropriate action):
 RELEASE _____ Hold for Approval _____
 Approval and terms acceptance

 Customer Signature Date
 CUMMINS POWER SOUTH, LLC
 POWER GENERATION

The following are the "Terms of Acceptance of Orders and Conditions of Sale." These terms also appear on the Acknowledgment of Sale form and are reproduced here. CUMMINS POWER SOUTH, LLC sales are limited to and made exclusively on these terms and CUMMINS POWER SOUTH, LLC's acceptance of any order is limited to the terms of the Seller and rejects any additional terms contained in any document that may be proposed by the Buyer

1. This Quotation is valid for 60 days * of the date quotation, Price shall remain firm provided our submittal drawings are approved and returned within 60 days after submission, and the ship date of the equipment is not extended by you or your customer beyond our published lead times. Delays or extension of the above lead times may necessitate escalation charges, on some or all equipment ordered.

2. Delivery is F.O.B. Factory. Freight is prepaid and allowed to the first destination within the continental United States. Generators (smaller than 601 kW) are shipped in an enclosed truck. Open trucking deliveries are available at an additional cost. Larger units are shipped via flat bed truck.

3. Prices for generators, transfer switches, switchgear and loose accessories as required, will be invoiced at the time of shipment, or when ready for shipment. Should the buyer delay, defer or refuse delivery, additional handling and storage charges may be assessed in lieu of the above stated escalation charges.

4. The equipment supplied by this manufacturer is custom fabricated to order and is subject to cancellation charges.

Switchgear, Generators and all build to order equipment are subject to the following minimum charges assessed for cancellation of any order: 25% of total order price if cancellation is received in our office between the date of order entry and the date we receive written submittal drawing approval. 50% of total order price if cancellation is received in our office after we receive submittal drawing approval. 75% of total order price if cancellation is received in our office 60 or fewer days before the scheduled shipping date of the order. 85% of total order price if cancellation is received in our office after the equipment is assembled.

The exact dollar value of the cancellation charge will be determined after our costs due to the cancellation are determined. A written notice of cancellation is required. The Standard generator cancellation charges are 25% of the total order price after release of order from our factory.

5. Payment terms are net 30 days from date of invoice, subject to approval of our credit department at the time of the order. Non domestic orders (final delivery locations outside the U.S.) are subject to a deposit of 25% at the time of order. Balance shall be paid prior to shipment. Export order (delivery outside the US) may require a letter of credit drawn on a U.S. bank. Retainage shall be limited to 10%. Payment of retainage is due at completion of start up or payable no later than 90 days from the original invoice.

6. Cummins Power South is not responsible for delays in delivery due to fire, strikes, accidents, Acts of Nature, war, explosion, flood, accidents or other causes beyond our control. Quoted shipping schedules are not guaranteed and subject to change without notice. In no case is Cummins Power South responsible for incidental or consequential damages. Cummins Power South does not accept liquidated damages as a part of third party contracts.

7. Each product offered in this quotation is accompanied by an expressed written manufacturer's warranty and is the only warranty offered.

8. An order for the equipment covered by this quotation will be accepted on a hold for release basis. Your order will not be released and scheduled for production until written approval to proceed is received in our office.

9. The quotation offered here in is limited to the plans and specification sections listed on our quotation. No other sections shall apply. Additional requirements for administrative items may require additional cost.

10. Unless otherwise stated on our quotation, O&M manuals are limited to one set. Additional sets of O&M manuals are available at an additional cost. The manufacturer's standard format shall apply. Custom O&M manuals will be available at an additional charge.

11. Start up services, load bank testing, and owner training are not provided unless stated on our quotation. Start up services will not proceed until the buyer's account is current and in good standing.

12. Our standard quotation does not include off unit wiring, off unit plumbing, off loading, rigging, installation, exhaust insulation or fuel. Unless otherwise stated and detailed within quote. Taxes unless otherwise stated are not included in our price.

Submitted by



Rafael Godinez , Power Generation Sales
rafael.godinez@cummins.com
Mobile: 786-236-1981
Fax: 305-390-0403



Appendix “R”
Hydrologic Monitoring Maps
Total Pages 2

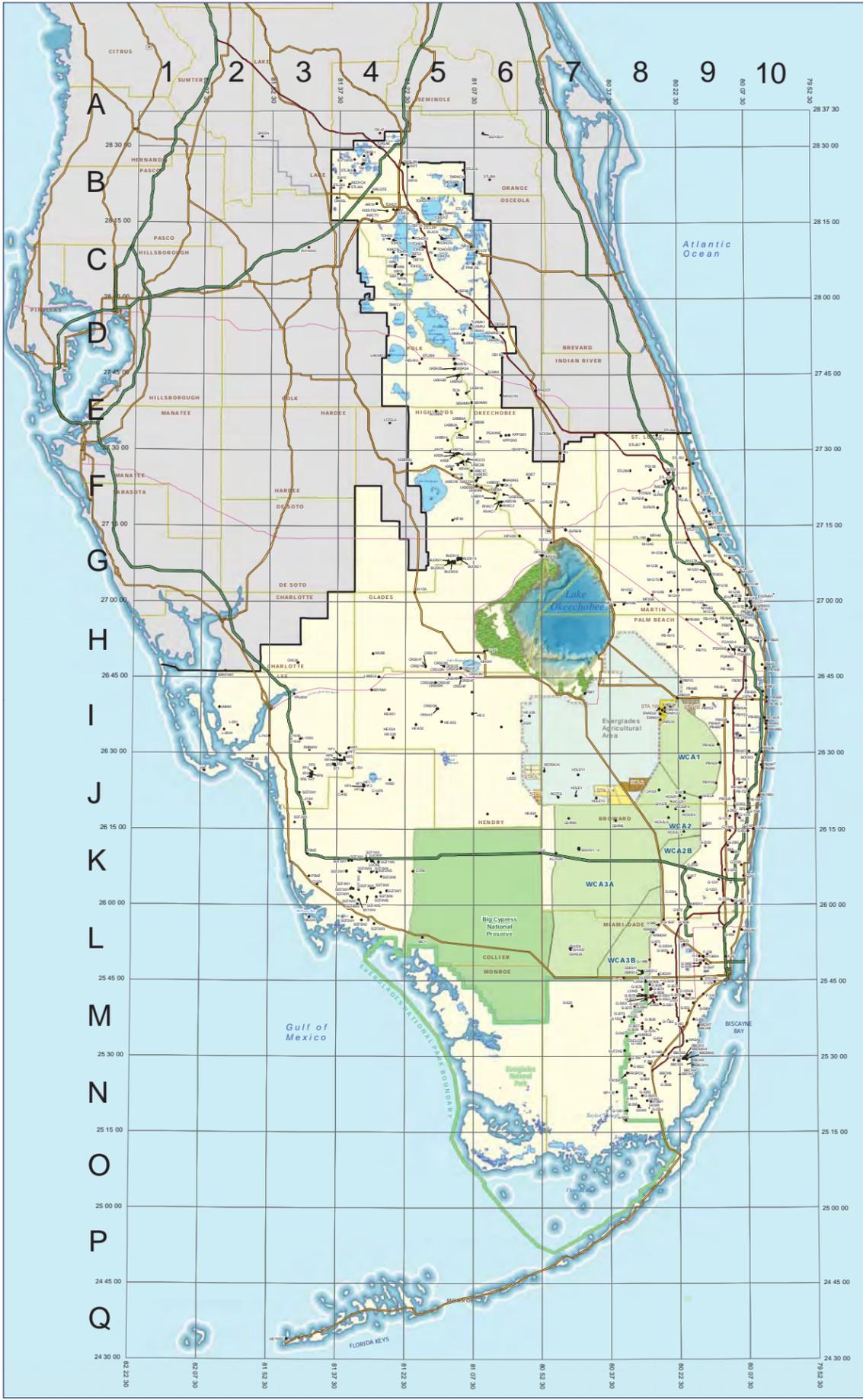
Hydrologic Monitoring – Active Well Sites

SITE INDEX

Agency	County	Site Name	Latitude	Longitude
United States Geological Survey (USGS)	Alachua	01A	28.3700	81.7200
		01B	28.3700	81.7200
		01C	28.3700	81.7200
		01D	28.3700	81.7200
		01E	28.3700	81.7200
		01F	28.3700	81.7200
		01G	28.3700	81.7200
		01H	28.3700	81.7200
		01I	28.3700	81.7200
		01J	28.3700	81.7200
South Florida Water Management District (SFWMD)	Alachua	02A	28.3700	81.7200
		02B	28.3700	81.7200
		02C	28.3700	81.7200
		02D	28.3700	81.7200
		02E	28.3700	81.7200
		02F	28.3700	81.7200
		02G	28.3700	81.7200
		02H	28.3700	81.7200
		02I	28.3700	81.7200
		02J	28.3700	81.7200

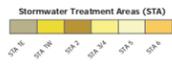
SITE INDEX (CONT.)

Agency	County	Site Name	Latitude	Longitude
South Florida Water Management District (SFWMD)	Alachua	03A	28.3700	81.7200
		03B	28.3700	81.7200
		03C	28.3700	81.7200
		03D	28.3700	81.7200
		03E	28.3700	81.7200
		03F	28.3700	81.7200
		03G	28.3700	81.7200
		03H	28.3700	81.7200
		03I	28.3700	81.7200
		03J	28.3700	81.7200



Legend

- Monitoring Agency**
 - South Florida Water Management District (SFWMD)
 - United States Geological Survey (USGS)
- Other Areas of Interest**
 - SFWMD Canals
 - Interstate Hwy
 - Turnpike
 - U.S. Roads
 - State Roads
 - County Boundary
 - Everglades Agricultural Area (EAA)
 - Water Conservation Area (WCA)
 - Everglades National Park (ENP)
 - Big Cypress National Preserve (BCNP)



Note:

Well monitoring sites represent current and active locations monitored by SFWMD, other agencies and contractors. The data for well monitoring are stored in the DBHYDRD corporate database. Status of non-SFWMD data is based on the date of the most recent data received. All site coordinates are gathered using approved professional grade GPS receivers with sub-meter accuracy.

Site / Station Definitions

STATION:
A specific coordinate that indicates where data (observations, sampling or monitoring) are collected. Data are usually assigned to stations by various classifications such as stage, flow, weather, and water quality. A coordinate may have more than one station associated with it. The name given to a station has traditionally been similar to, or an exact duplicate of, the corresponding site name.

SITE:
A representative point used to designate one or more stations that are associated by proximity or project. Site level representation is to provide clarity for small scale mapping in lieu of displaying a high density of associated stations. The site location is often based on the position of a recording device, such as a remote terminal unit (RTU), or can be derived from a common sense location between the associated stations. A site should not be viewed as an area feature with specific boundaries but simply as a representative location of activity.

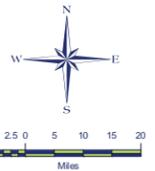
IMPORTANT DISCLAIMER:

This map is a conceptual or planning tool only. The South Florida Water Management District does not guarantee or make any representation regarding the information contained herein. It is not self-executing or binding, and does not affect the interests of any persons or properties, including any present or future right or use of real property.

South Florida Water Management District

Restoration Sciences Department
3301 Galt Oak Rd.
West Palm Beach, FL 33406
561-488-8800

Map Updated 3/01/2011
Map Composition by: Diane Malone, Nikki Carlson
(e-mail: dmalone@sfwmd.gov, ncarlson@sfwmd.gov)



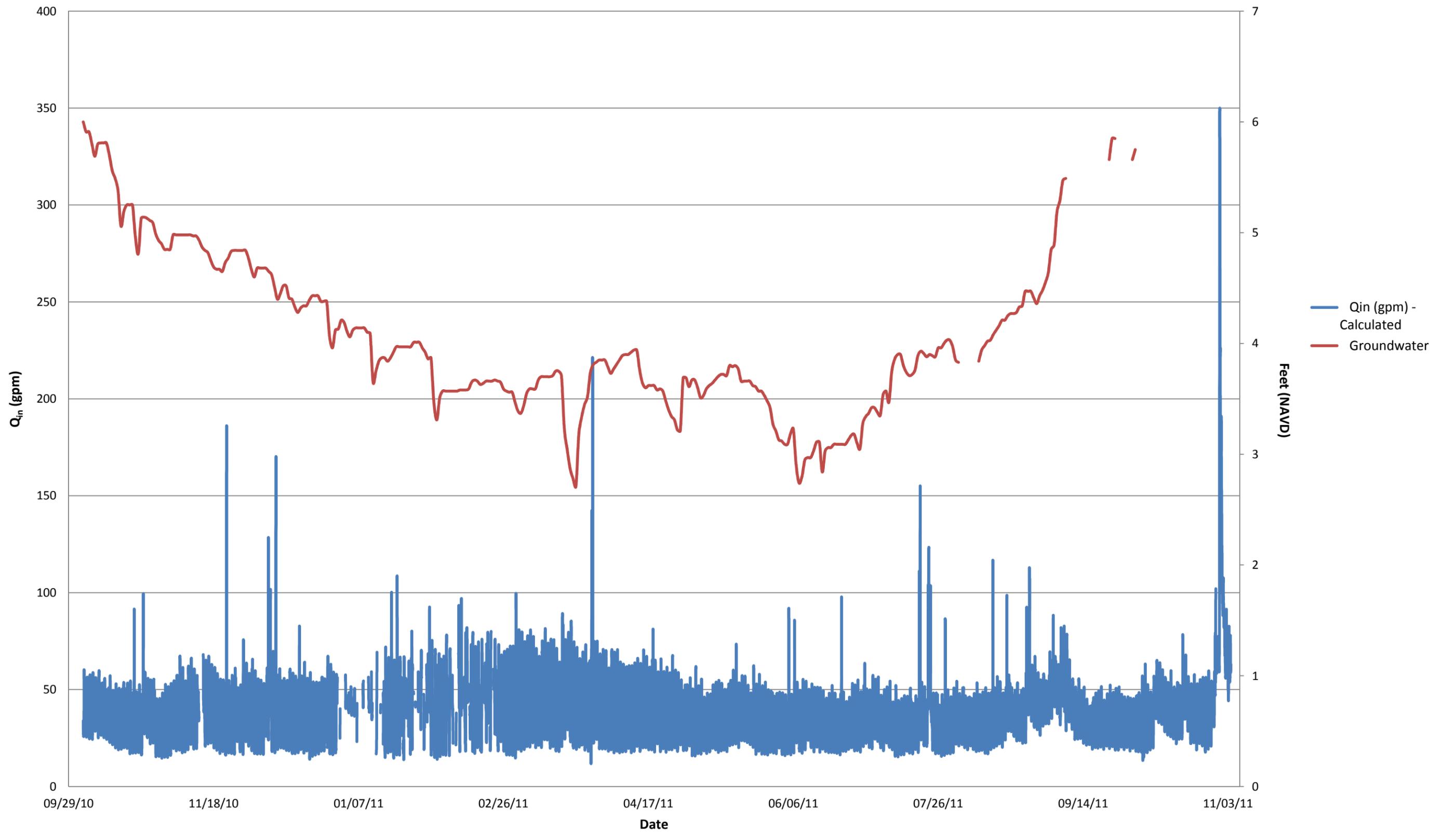
Projection Datum: North American 1983 HARN
Coordinate System: State Plane Florida East



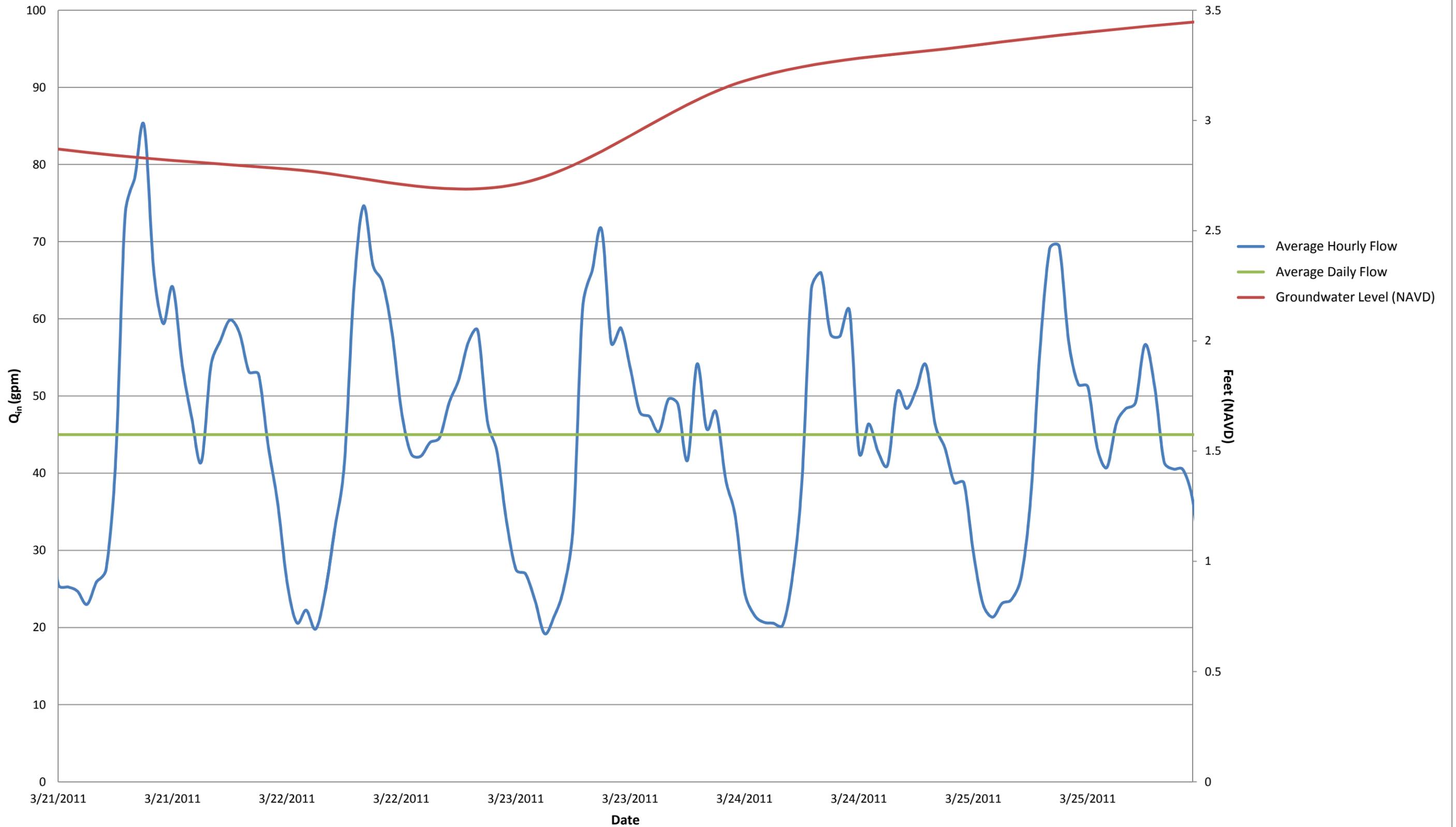


Appendix "S"
Hibiscus and Seagrape Lift Station Hydrographs
Total Pages 8

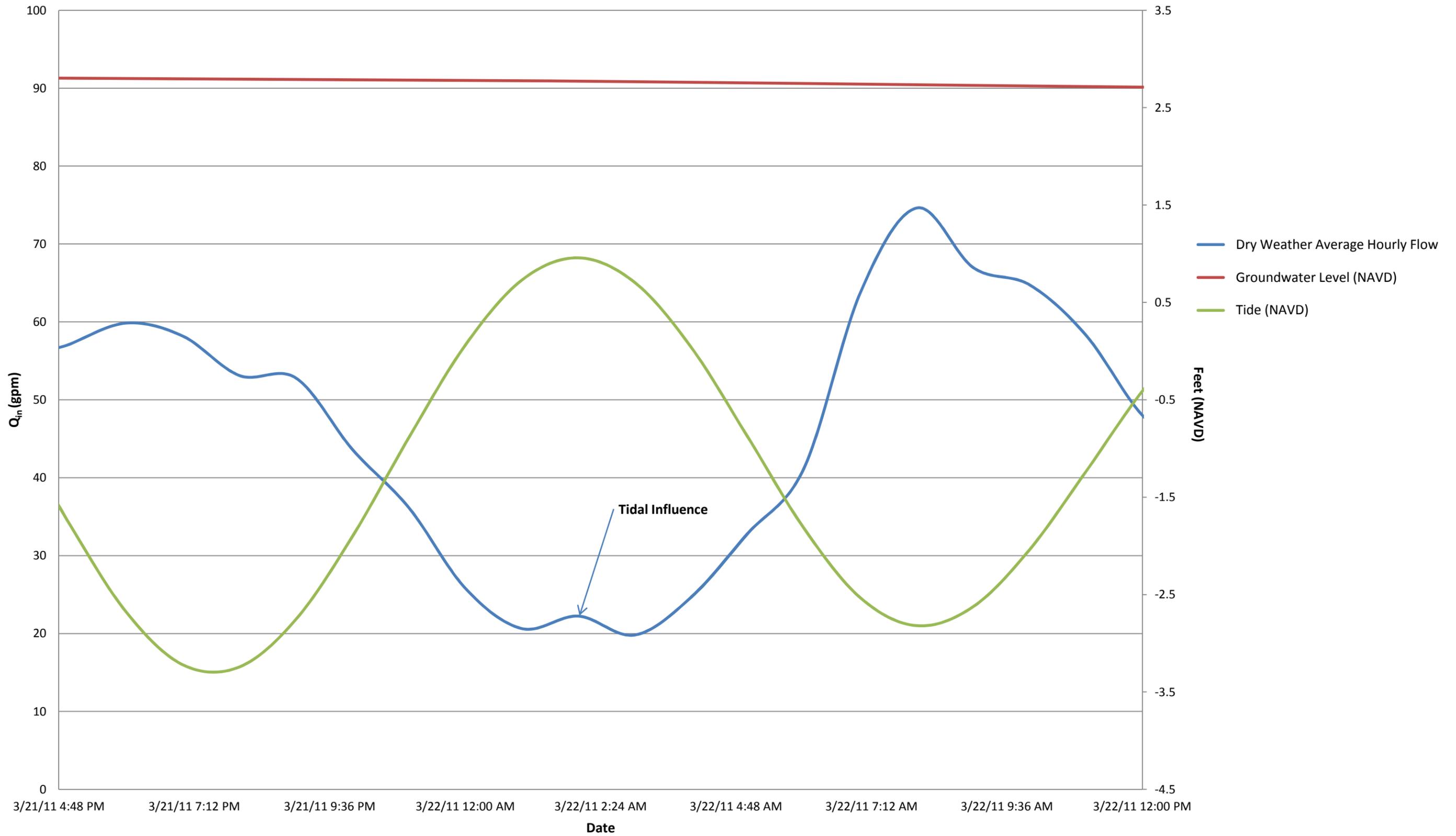
Hibiscus Lift Station (LS # 25 (2)) - Average Hourly Flow with Groundwater Overlay



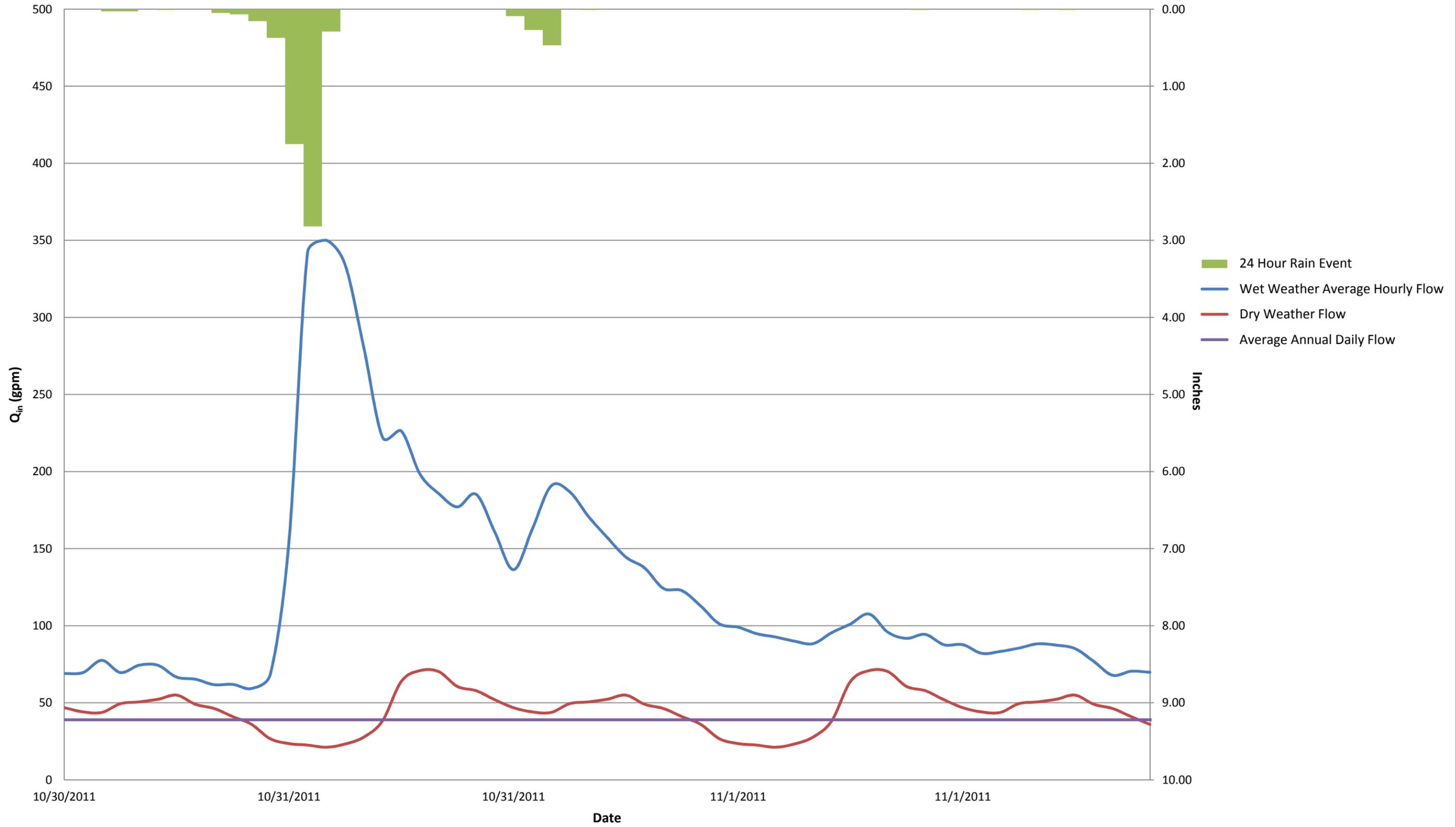
Hibiscus Lift Station (LS # 25 (2)) - Dry Weather Hydrograph



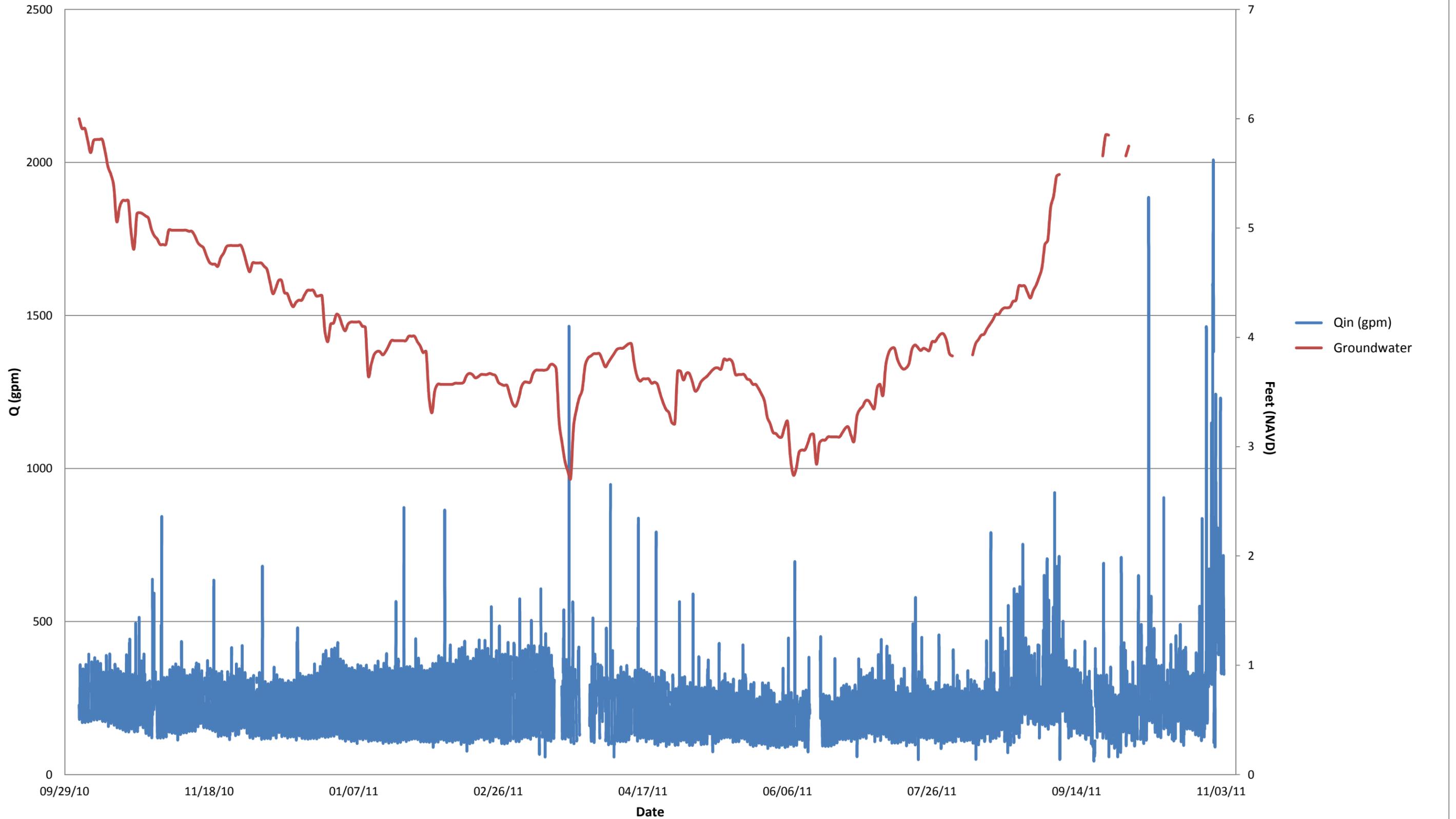
Hibiscus Lift Station (LS # 25 (2)) - Tidal Influence



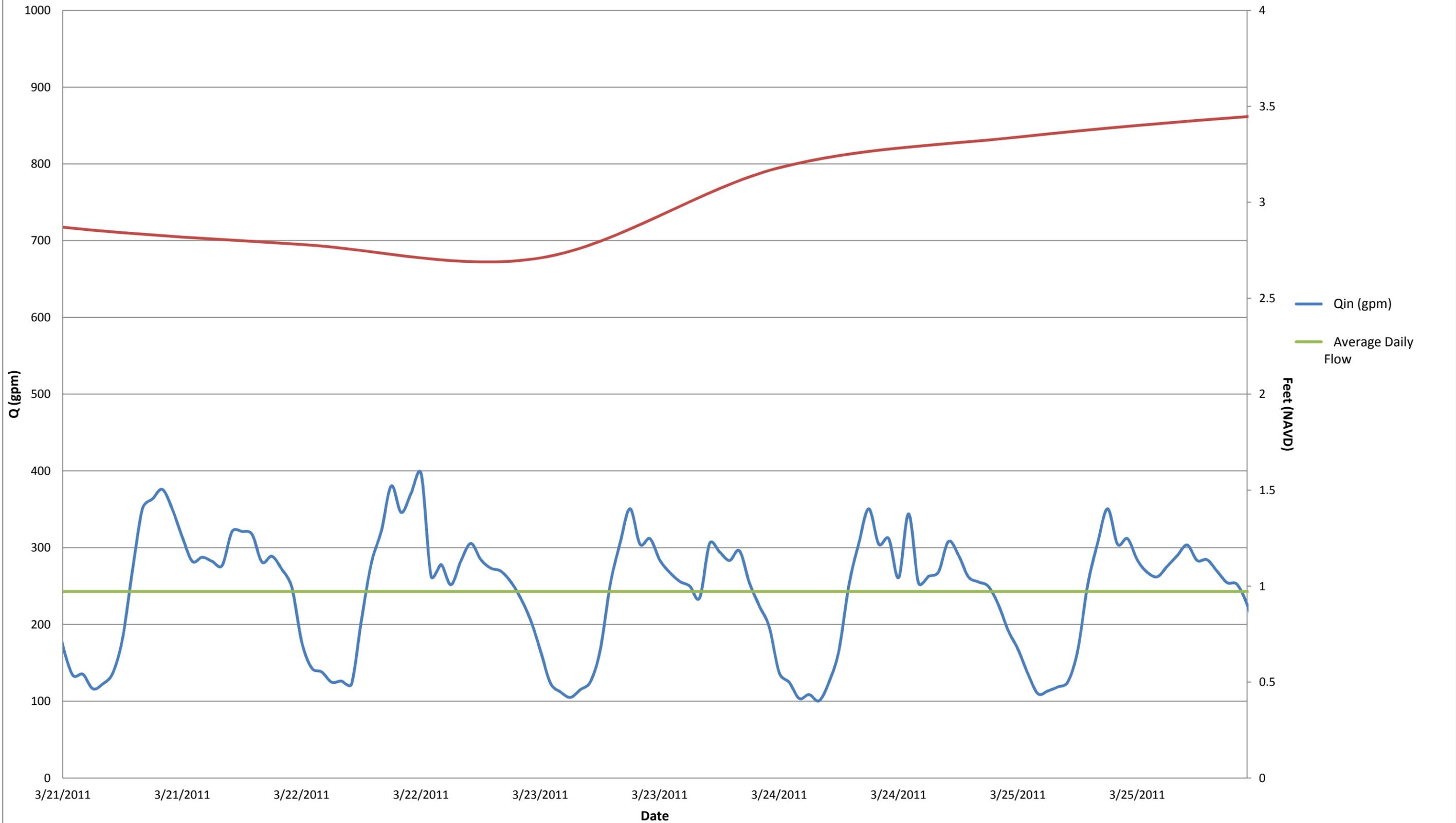
Hibiscus Lift Station (LS #25 (2)) - Wet Weater Flow With Related Rainfall Hyetograph



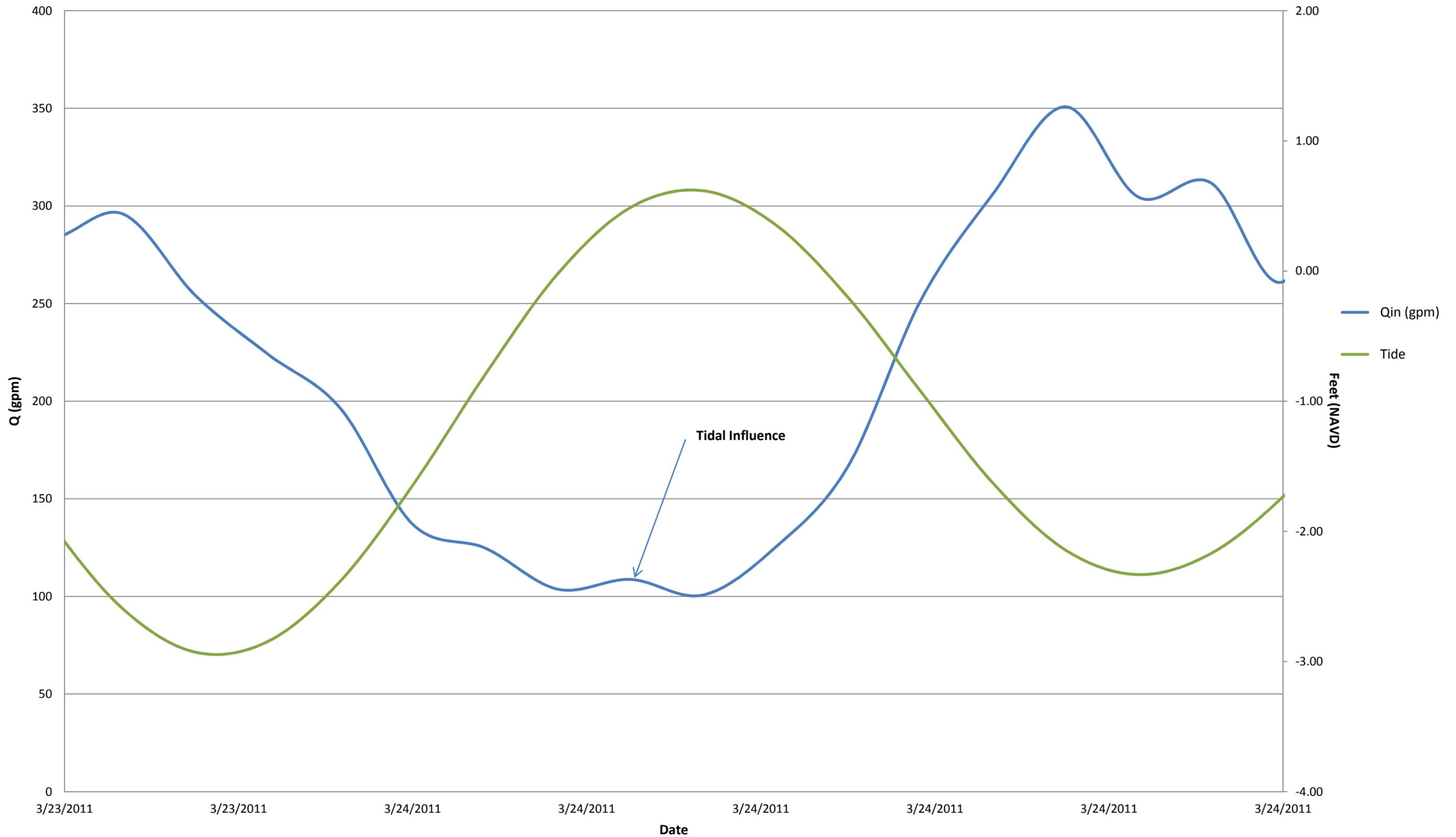
Seagrape Lift Station (LS # 24 (10)) - Average Hourly Flow with Groundwater Overlay



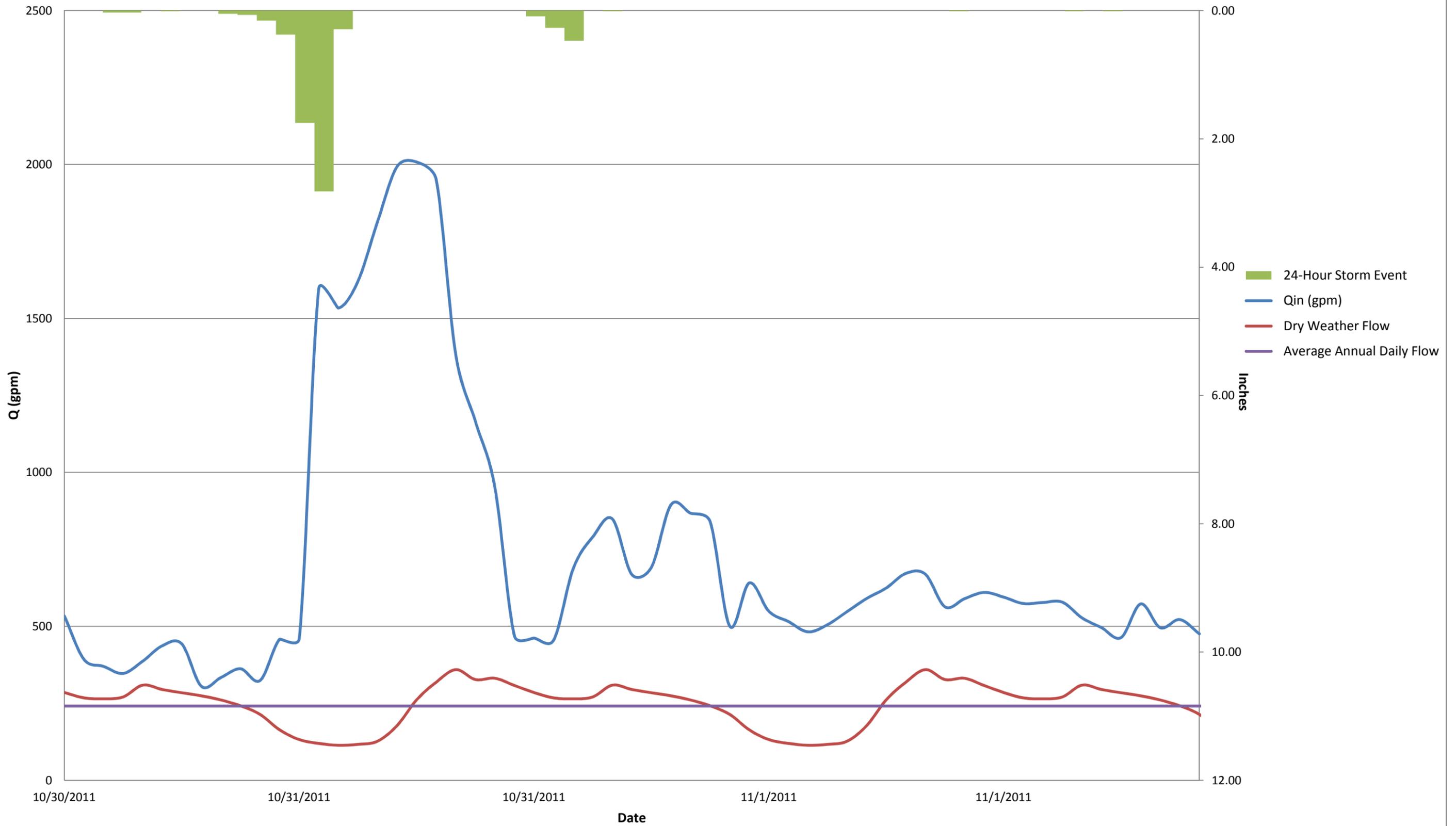
Seagrape Lift Station (LS # 24 (10)) - Dry Weather Hydrograph



Seagrape Lift Station (LS # 24 (10)) - Tidal Influence



Seagrape Lift Station (LS # 24 (10)) - Wet Weather Flow with Related Rainfall Hyetograph





Appendix "T"

CD Rom Containing Sanitary Sewer Capital Improvements Plan
Total Pages 1

