South Granville Water and Sewer Authority

I-85 Sanitary Sewer Study Update: July 2020 Board Meeting

Scott N. Schroyer, Executive Director

I-85 Sewer Project - Timeline

April 2018	May 2019	Nov. 2019	Feb. 2020	Mar. 2020	July 2020
• SGWASA enters into an Agreement with Coulter Jewell Thames P.A. (CJT) to perform sanitary sewer study (I-85 area).	• I-85 Sanitary Sewer Study completed.	• SGWASA enters into an Agreement with CJT to develop tactical construction schedule.	• I-85 Sanitary Sewer Tactical construction schedule completed.	• Board/Finance Committee and staff review tactical schedule and analyze funding scenarios.	• Board presentation and discussion on project priorities and funding scenarios.

I-85 Sewer Project - Objectives

- Address deficiencies in the current sanitary sewer collection/pumping system that coveys wastewater from the east side of I-85 (Creedmoor and Old Lyons Station District Collection Systems) through the Butner Collection System (west side of I-85) to SGWASA'S Wastewater Treatment Plant.
- Evaluate existing pump stations and the possibility of eliminating existing pump stations with the extension of new gravity sanitary sewers.
- Design a preliminary layout of sanitary sewers, pump stations, and force mains to serve specific areas.
- Provide SGWASA a "Master Plan" for service to meet current and future sanitary sewer needs.

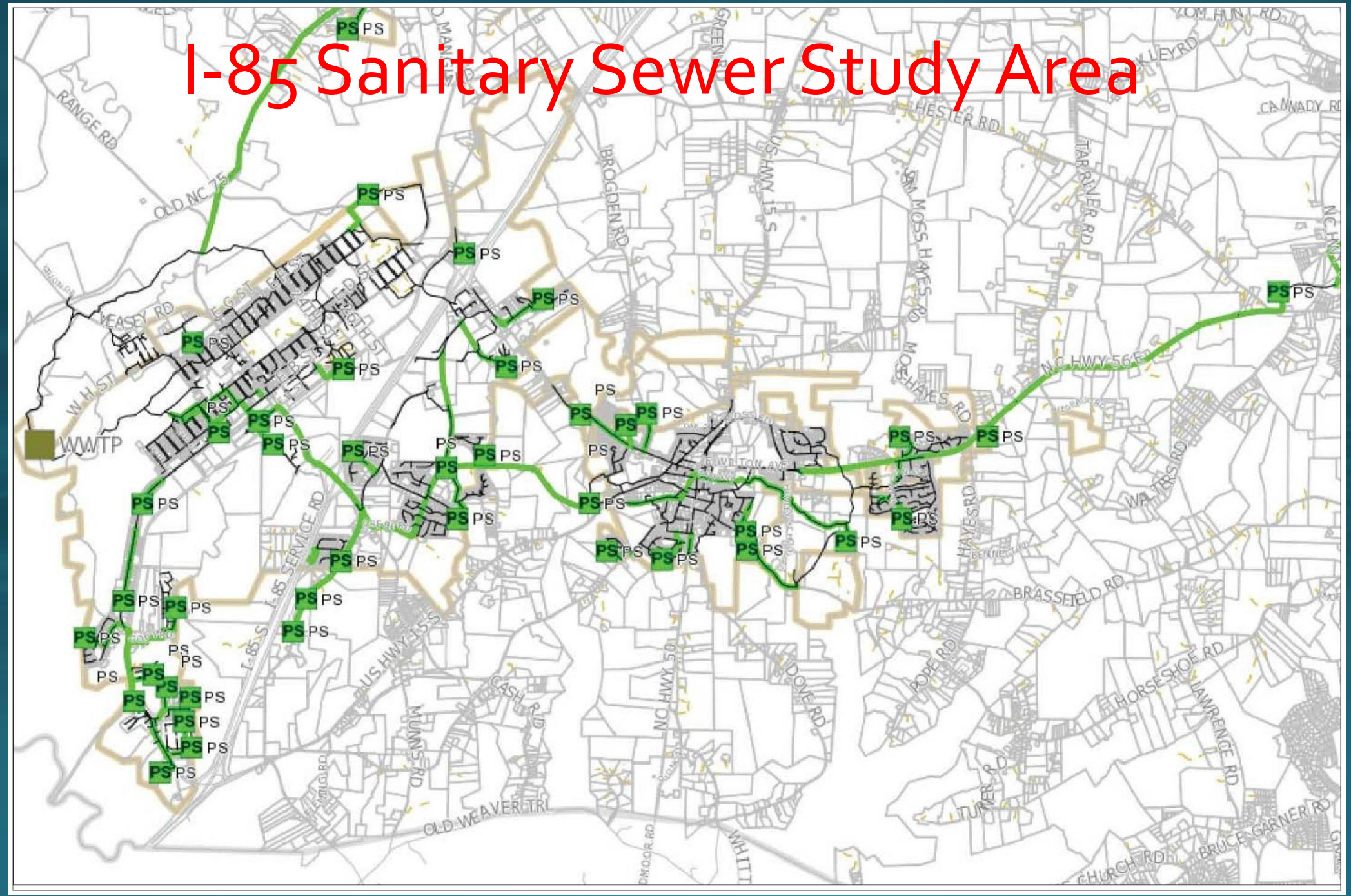
Existing Sanitary Sewer Collection System

- Sanitary Sewer Collection System
  - Total Length of Gravity Sanitary Sewer = 110 miles
  - Lift Stations = 51
  - Force Main Piping = 40 miles
  - Manholes = 2,570
- Wastewater Treatment Plant Capacity
  - Permitted to treat up to 5.5 Million Gallons per Day (MGD)
  - CY 2019 produced wastewater at the following rates:
    - Average: 1.54 MGD
    - Minimum: 1.05 MGD
    - Maximum: 3.38 MGD

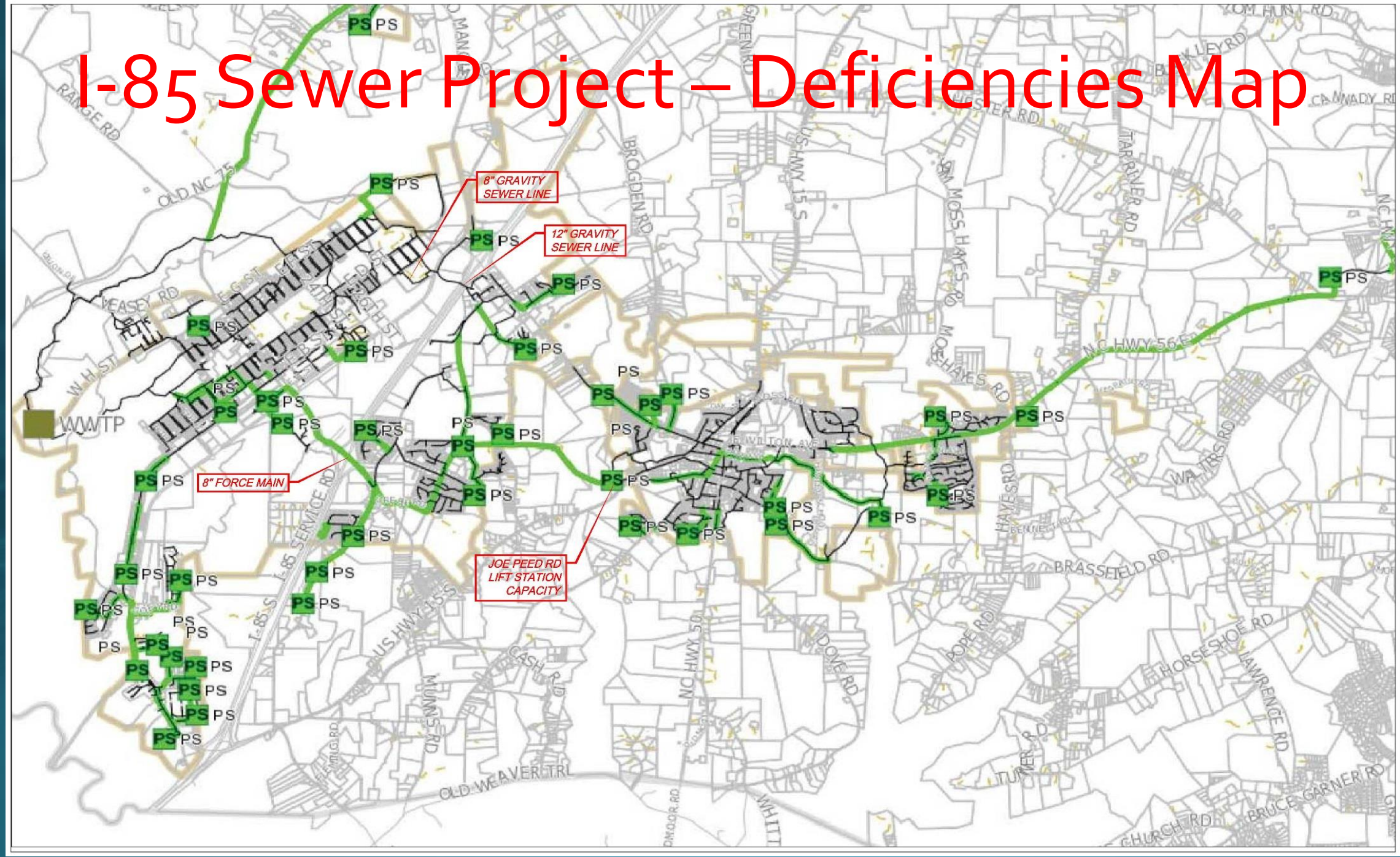
SGWASA – I-85 Sanitary Sewer Study

- In 2019 SGWASA received a comprehensive sanitary sewer system evaluation, commonly referred to as the I-85 Study.
- The I-85 Study evaluated the major sanitary sewer trunk lines and specific pump stations in the area to determine what improvements needed to be made to the system for both short-term and long-term needs.
- The study identified 4 priority project areas, with an estimated design and construction cost of $50 million.

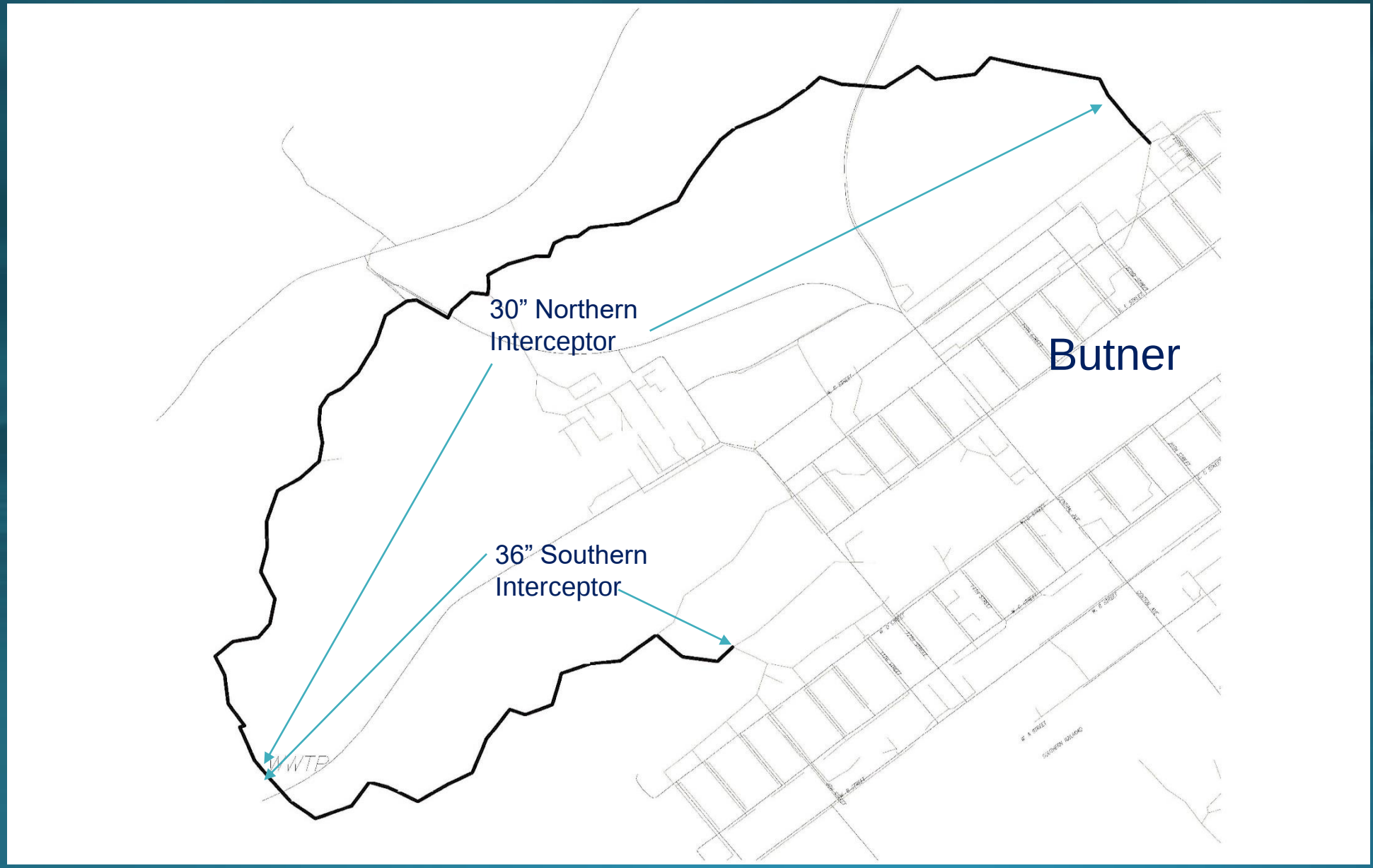
I-85 Sanitary Sewer Study Area



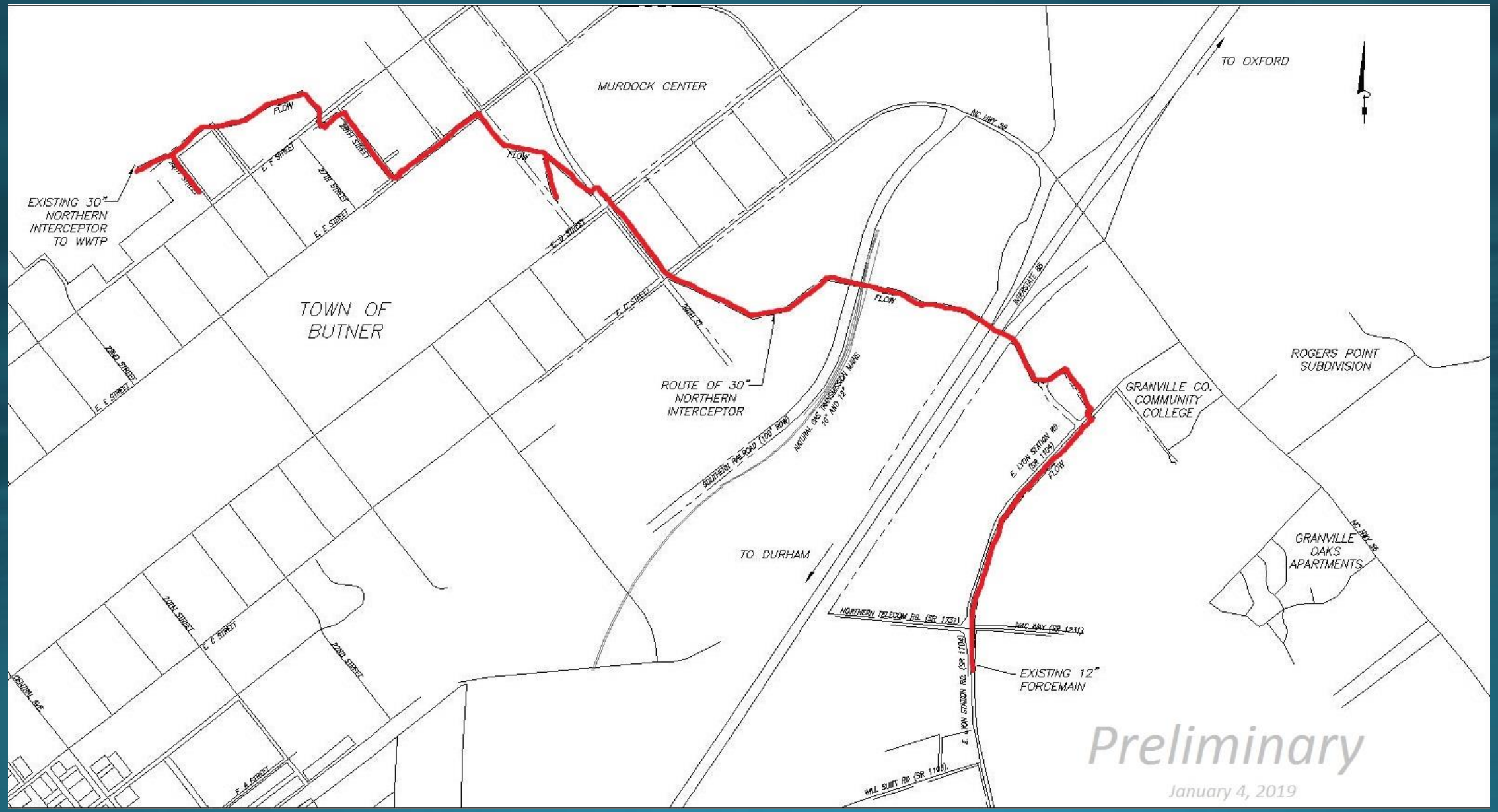
I-85 Sewer Project – Deficiencies Map



I-85 Sewer Project – Existing Northern & Southern Interceptors



I-85 Sewer Project – Proposed Northern Interceptor



I-85 Sewer Project – Proposed Southern Interceptor

Study Conclusions – 4 Priorities $50 Million

- Priority #1:
  - Northern Interceptor (30" diameter) Sewer Pipe Improvements.
    - Estimated cost: $13m
- Priority #2:
  - Southern Interceptor (36" diameter) Sewer Pipe Improvements.
    - Estimated cost: $15m
- Priority #3:
  - New Joe Peed Rd. Pump Station & Force Main Improvements.
    - Estimated cost: $12m
- Priority #4:
  - New East Middleton Rd. Pump Station & Force Main Improvements.
    - Estimated cost: $7m

I-85 Sanitary Sewer Study – Tactical Plan for Construction

- 11/2019: CJT tasked with developing a tactical priority schedule to:
  - Identify and illustrate priorities
  - Identify annualized financial costs
  - Show dependent relationships between activities and project schedule to accomplish the required work
  - Develop Gantt charts to illustrate the four priority projects.
    - The Gantt charts were prepared illustrating the following design/construction plans:
      - 5-year
      - 7-year
      - 10-year

I-85 Sanitary Sewer Study – Tactical Plan for Construction

- Each schedule provided insights to the annualized costs associated to each tactical plan.
- The 7-year and 10-year schedules were developed to show annualized costs not exceeding $10m per year.
- The 5-year schedule did not place dollar amount constraints on an annual basis.
- Additional scenarios can be produced representing various tactical plan constraints.

I-85 Sanitary Sewer Study – Tactical Plans Cost/Year for Construction

5-year Plan Costs

Year 1:	Year 2:	Year 3:	Year 4:	Year 5:
$809k	$7.8m	10.1m	$14.m	$12.5m

7-year Plan Costs

Year 1:	Year 2:	Year 3:	Year 4:	Year 5:	Year 6:	Year 7:
$809k	$7.8m	9.7m	$9.3m	$9.9m	$6m	$2.5m

10-year Plan Costs

Year 1:	Year 2:	Year 3:	Year 4:	Year 5:	Year 6:	Year 7:	Year 8:	Year 9:	Year 10:
$474k	$4.3m	4.8m	$3.8m	$6.4m	$4.2m	$6.6m	$8.8m	$5.0m	$1.2m

I-85 Sanitary Sewer Study : 5-Year Plan

SGWASA I-85 SEWER STUDY
PRELIMINARY PRIORITY SCHEDULE - 5 YEAR PLAN

ITEMS	Cost	YR-1	YR-2	YR-3	YR-4	YR-5	YR-6
PRIORITY NO. 1							
NORTHERN INTERCEPTOR	12,912,861						
A. Geotechnical Borings	55,000						
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	10,000						
C. Environmental Permitting	18,000						
D. Exploratory Digs (Potholing)	24,000						
II. DESIGN AND TECHNICAL SPECIFICATIONS	302,000						
III. EASEMENT PLATS	50,000						
IV. PERMITTING	15,000						
V. PHASE 1 CONSTRUCTION (STA. 0+00 to STA. 52+47)	4,320,561						
VI. PHASE 2 CONSTRUCTION (to STA. 110+55.26)	4,796,814						
VII. PHASE 3 CONSTRUCTION PHASE (to STA. 158+00 END)	3,321,486						
		474,000	4,320,561	4,796,814	3,321,486		
PRIORITY NO. 2							
SOUTHERN INTERCEPTOR	14,819,478						
A. Geotechnical Borings	66,000						
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	9,000						
C. Environmental Permitting	18,000						
D. Exploratory Digs (Potholing)	20,000						
II. DESIGN AND TECHNICAL SPECIFICATIONS	346,400						
III. EASEMENT PLATS	75,000						
IV. PERMITTING	15,000						
V. PHASE 1 CONSTRUCTION (STA. 0+00 to STA. 76+15)	8,068,720						
VI. PHASE 2 CONSTRUCTION (to STA. 151+04)	6,201,358						
		334,934	3,441,954	4,841,232	4,961,086	1,240,272	
PRIORITY NO. 3							
NEW JOE PEED ROAD							
PUMP STATION / FORCE MAIN	11,250,050						
A. Geotechnical Borings	60,000						
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	10,500						
C. Environmental Permitting	20,000						
D. Exploratory Digs (Potholing)	20,000						
E. Flow Monitoring to Existing Joe Peed Road Pump Station	30,000						
II. DESIGN AND TECHNICAL SPECIFICATIONS	749,290						
III. EASEMENT PLATS	50,000						
IV. PERMITTING	20,000						
V. CONSTRUCTION	10,290,260						
				377,766	4,698,128	6,174,156	
PRIORITY NO. 4							
NEW EAST MIDDLETON ROAD							
PUMP STATION / FORCE MAIN	6,854,597						
A. Geotechnical Borings	51,000						
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	6,500						
C. Environmental Permitting	18,000						
D. Exploratory Digs (Potholing)	18,000						
E. Flow Monitoring to Existing East Middleton Road PS	30,000						
II. DESIGN AND TECHNICAL SPECIFICATIONS	424,525						
III. EASEMENT PLATS	40,000						
IV. PERMITTING	20,000						
V. CONSTRUCTION	6,246,572						
				110,000	1,747,340	4,997,257	
	45,836,986	808,934	7,762,515	10,125,812	14,728,040	12,411,685	

I-85 Sanitary Sewer Study : 7-Year Plan

SGWASA I-85 SEWER STUDY
PRELIMINARY PRIORITY SCHEDULE - 7 YEAR PLAN

NOVEMBER

ITEMS	Cost	YR-1	YR-2	YR-3	YR-4	YR-5	YR-6	YR-7
PRIORITY NO. 1								
NORTHERN INTERCEPTOR	12,912,861							
A. Geotechnical Borings	55,000							
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	10,000							
C. Environmental Permitting	18,000							
D. Exploratory Digs (Potholing)	24,000							
II. DESIGN AND TECHNICAL SPECIFICATIONS	302,000							
III. EASEMENT PLATS	50,000							
IV. PERMITTING	15,000							
V. PHASE 1 CONSTRUCTION (STA. 0+00 to STA. 52+47)	4,320,561							
VI. PHASE 2 CONSTRUCTION (to STA. 110+55.26)	4,796,814							
VII. PHASE 3 CONSTRUCTION PHASE (to STA. 158+00 END)	3,321,486							
		474,000	4,320,561	4,796,814	3,321,486			
PRIORITY NO. 2								
SOUTHERN INTERCEPTOR	14,819,478							
A. Geotechnical Borings	66,000							
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	9,000							
C. Environmental Permitting	18,000							
D. Exploratory Digs (Potholing)	20,000							
II. DESIGN AND TECHNICAL SPECIFICATIONS	346,400							
III. EASEMENT PLATS	75,000							
IV. PERMITTING	15,000							
V. PHASE 1 CONSTRUCTION (STA. 0+00 to STA. 76+15)	8,068,720							
VI. PHASE 2 CONSTRUCTION (to STA. 151+04)	6,201,358							
		334,934	3,441,954	4,841,232	4,961,086	1,240,272		
PRIORITY NO. 3								
NEW JOE PEED ROAD								
PUMP STATION / FORCE MAIN	11,250,050							
A. Geotechnical Borings	60,000							
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	10,500							
C. Environmental Permitting	20,000							
D. Exploratory Digs (Potholing)	20,000							
E. Flow Monitoring to Existing Joe Peed Road Pump Station	30,000							
II. DESIGN AND TECHNICAL SPECIFICATIONS	749,290							
III. EASEMENT PLATS	50,000							
IV. PERMITTING	20,000							
V. CONSTRUCTION	10,290,260							
				15,000	944,790	8,232,208	2,058,052	
PRIORITY NO. 4								
NEW EAST MIDDLETON ROAD								
PUMP STATION / FORCE MAIN	6,854,597							
A. Geotechnical Borings	51,000							
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	6,500							
C. Environmental Permitting	18,000							
D. Exploratory Digs (Potholing)	18,000							
E. Flow Monitoring to Existing East Middleton Road PS	30,000							
II. DESIGN AND TECHNICAL SPECIFICATIONS	424,525							
III. EASEMENT PLATS	40,000							
IV. PERMITTING	20,000							
V. CONSTRUCTION	6,246,572							
						443,432	3,912,537	2,498,628
	45,836,986	808,934	7,762,515	9,653,046	9,227,362	9,915,912	5,970,589	2,498,628

I-85 Sanitary Sewer Study : 10-Year Plan

ITEMS	Cost	YR-1	YR-2	YR-3	YR-4	YR-5	YR-6	YR-7	YR-8	YR-9	YR-10
PRIORITY NO. 1											
NORTHERN INTERCEPTOR	12,912,861										
A. Geotechnical Borings	55,000										
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	10,000										
C. Environmental Permitting	18,000										
D. Exploratory Digs (Potholing)	24,000										
II. DESIGN AND TECHNICAL SPECIFICATIONS	302,000										
III. EASEMENT PLATS	50,000										
IV. PERMITTING	15,000										
V. PHASE 1 CONSTRUCTION (STA. 0+00 to STA. 52+47)	4,320,561										
VI. PHASE 2 CONSTRUCTION (to STA. 110+55.26)	4,796,814										
VII. PHASE 3 CONSTRUCTION PHASE (to STA. 158+00 END)	3,321,486										
		474,000	4,320,561	4,796,814	3,321,486						
PRIORITY NO. 2											
SOUTHERN INTERCEPTOR	14,819,478										
A. Geotechnical Borings	66,000										
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	9,000										
C. Environmental Permitting	18,000										
D. Exploratory Digs (Potholing)	20,000										
II. DESIGN AND TECHNICAL SPECIFICATIONS	346,400										
III. EASEMENT PLATS	75,000										
IV. PERMITTING	15,000										
V. PHASE 1 CONSTRUCTION (STA. 0+00 to STA. 76+15)	8,068,720										
VI. PHASE 2 CONSTRUCTION (to STA. 151+04)	6,201,358										
					549,400	6,454,976	4,094,288	3,720,814			
PRIORITY NO. 3											
NEW JOE PEED ROAD											
PUMP STATION / FORCE MAIN	11,250,050										
A. Geotechnical Borings	60,000										
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	10,500										
C. Environmental Permitting	20,000										
D. Exploratory Digs (Potholing)	20,000										
E. Flow Monitoring to Existing Joe Peed Road Pump Station	30,000										
II. DESIGN AND TECHNICAL SPECIFICATIONS	749,290										
III. EASEMENT PLATS	50,000										
IV. PERMITTING	20,000										
V. CONSTRUCTION	10,290,260										
							125,500	2,892,342	8,232,208		
PRIORITY NO. 4											
NEW EAST MIDDLETON ROAD											
PUMP STATION / FORCE MAIN	6,854,597										
A. Geotechnical Borings	51,000										
B. Environmental (Wetland, Buffers, Blueline Streams etc.)	6,500										
C. Environmental Permitting	18,000										
D. Exploratory Digs (Potholing)	18,000										
E. Flow Monitoring to Existing East Middleton Road PS	30,000										
II. DESIGN AND TECHNICAL SPECIFICATIONS	424,525										
III. EASEMENT PLATS	40,000										
IV. PERMITTING	20,000										
V. CONSTRUCTION	6,246,572										
								15,000	593,025	4,997,257	1,249,315
	45,836,986	474,000	4,320,561	4,796,814	3,870,886	6,454,976	4,219,788	6,628,156	8,825,233	4,997,257	1,249,315

Evaluating Various Funding Scenarios

- With the detailed information provided by the Gantt Charts for the 5-year, 7-year, and 10-year schedules, SGWASA's Executive Director and Finance Director evaluated various funding scenarios to better understand the affordability of the approximate $50 million construction plan.
- Due to the uncertainty of grant awards presently, grant dollars were not calculated into the funding scenarios, however, grants are being be pursued and the awarded grant dollars will lessen the amount of money needed for loans or bonds.

Funding Scenarios Analyzed

- The various funding scenarios presented below all require additional revenue to build the sanitary sewer projects within the next 5-10 years.

1. Design/Construct all four (4) Priority projects
    - $50 million **USDA loan** for a 40-year term, beginning in FY22-23
2. Phased Design/Construction Approach
    - $25 million **USDA loan** for a 40-year term, beginning in FY22-23
        - Design/Construction of Priority 1 and 2 projects
    - $25 million **USDA loan** for a 40-year term, beginning in FY26-27
        - Design/Construction of Priority 3 and 4 projects
3. Design/Construct all four (4) Priority projects
    - $50 million **Bond** for a 20-year term, beginning in FY22-23
4. Phased Design/Construction Approach
    - $25 million **Bond** for a 20-year term, beginning in FY22-23
        - Design/Construction of Priority 1 and 2 projects.
    - $25 million **Bond** for a 20-year term, beginning in FY26-27
        - Design/Construction of Priority 3 and 4 projects.
5. Phased Design/Construction Approach
    - $25.5 million **DEQ loan** for a 20-year term, beginning in FY22-23
    - $24.5 million **WIFIA** (Water Infrastructure Finance Innovation Act) **loan** for a 30-year term, beginning in FY27-28

I-85 Sanitary Sewer Study – Next Steps

- The Executive Director suggests further discussion with the Finance Committee on this topic, thus allowing the Finance Committee to further evaluate, and make a recommendation to the SGWASA Board on the timetable and associated funding scenarios to complete the I-85 Sanitary Sewer projects.

- Following, the SGWASA Board can further discuss and then determine the funding/construction sequencing timetables. The SGWASA Board will also have an opportunity to discuss this project later this fall during the Strategic Plan workshops.
  - Note: The Finance Committee is scheduled to meet on August 20, 2020.

I-85 Sanitary Sewer Study – Next Steps (cont.)

- The Executive Director is presently working with SGWASA's contract engineering firm:
  - to issue in July, the Request for Qualifications (RFQ) for the engineering design work for Priorities #1 and #2 (northern and southern interceptor pipe projects).
  - to issue later this fall, the Request for Qualifications (RFQ) for the engineering design work for Priorities #3 and #4 (pump stations).
- The Executive Director will bring to the Board recommendations for contract awards for the engineering design work when appropriate this fiscal year.
- The goal is to get the engineering design work started this fiscal year on all four (4) Priority projects.

I-85 Sanitary Sewer Study – Next Steps (cont.)

- The Executive Director is working:
  - with SGWASA's contract engineering firm to further evaluate what additional short-term, cost effective pipe and pump improvements can be made to the collection system that would provide additional capacity while the larger pipe/pump projects are being designed/built.
  - toward incorporating real-time flow monitoring equipment throughout critical points in the collection system, thus assisting in identifying the stormwater Inflow and Infiltration (I&I) areas that need to be corrected.
    - Identifying and then eliminating the stormwater I&I may also provide some capacity in the existing pipes and pump stations.

Comments/Questions/Discussion