

Cochran Road WWTP Expansion

City of Clemson



**DESIGN SOUTH
PROFESSIONALS, INC.**

engineers architects planners



October 12, 2016

THE PROJECT

- Expansion of Cochran Road WWTP
- Increase from 1.15 MGD to 2.0 MGD
- Comply with SCDHEC Flow Allocation Policies
- Allow continued issuance of sewer construction permits



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

COCHRAN ROAD WWTP HISTORY

- Commissioned in 1964 with 0.2 MGD capacity
- Upgraded and Expanded to 0.55 MGD in 1973
- Expanded to 1.0 MGD in 1985
- Re-rated to 1.15 MGD in 1997
- New Sludge Digester added in 2010
- Supplemental Aeration added in 2016



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

UPGRADE AND EXPANSION CHALLENGES

- Age of Facilities (40+ years)
- Limited Space for Expansion
- Stringent Discharge Limitations into Lake Hartwell
- Compliance Issues
- Cost of Expansion



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.

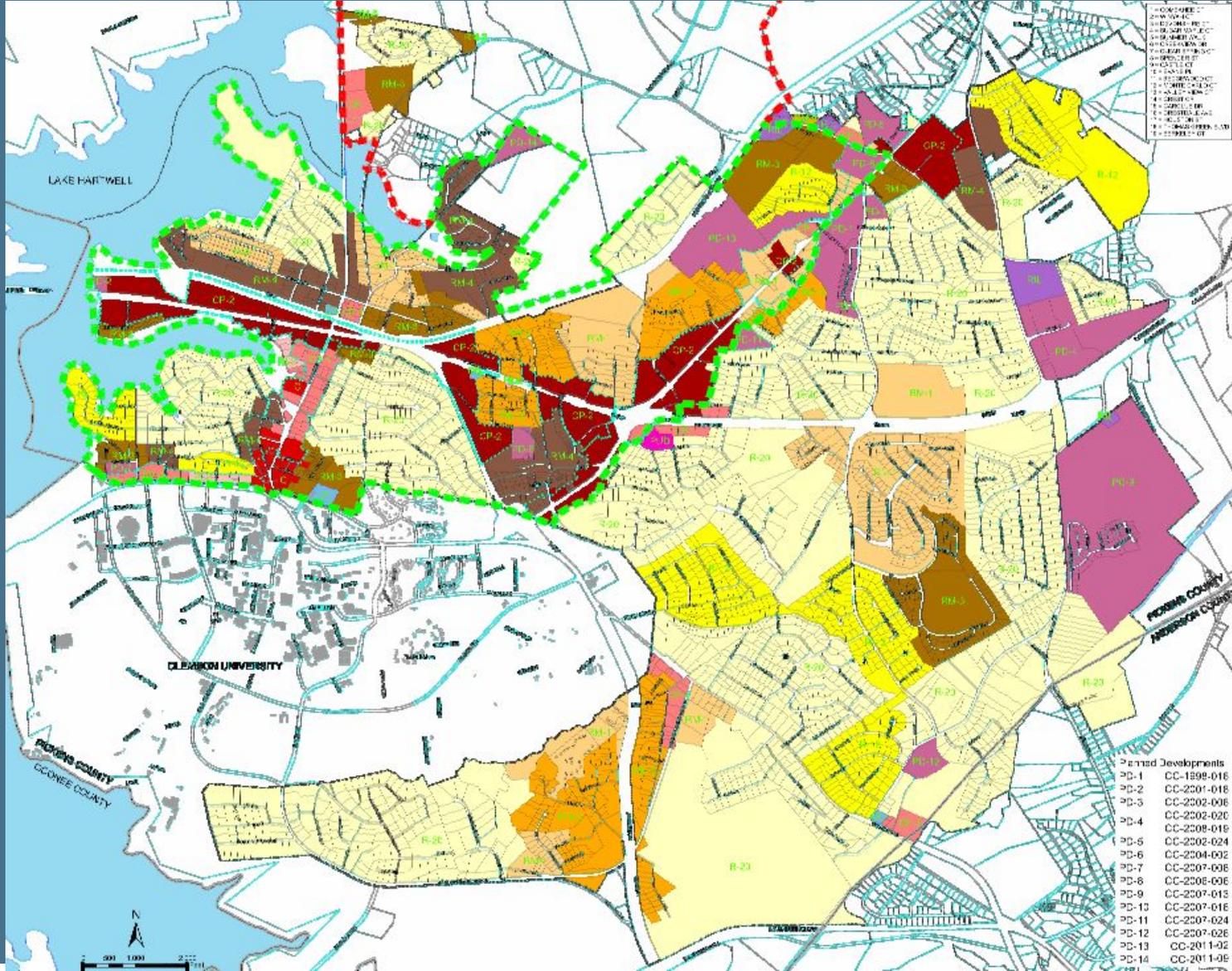


DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

POPULATION AND GROWTH IMPACT ON PLANT EXPANSION

- Clemson population has grown 14% in 10 years and still growing.
- Plant serves 2,300+ residential and commercial customers.
- Flow allocation tracked by SCDHEC exceeds 1.15 MGD.
- City operating under a “Flow Advancing Agreement” until actual plant flows reach 1.035 MGD.
- Present Average Day Flow is 0.830 MGD.
- Proposed development projects expected to come on line, adds 0.190 MGD and increasing Average Daily Flow to 1.02 MGD.
- City wants to hold 10,000 GPD for future economic development.
- Only 0.015 MGD available for future allocation.





CITY of CLEMSON, SC
 IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
 engineers architects

DISCHARGE LIMITATIONS IMPACT ON PLANT EXPANSION

- Treated effluent from plant is discharged to Lake Hartwell
- No water quality model to address pollutant loadings
- Pollutant loadings therefore fixed
- Flow increases accompanied by more stringent pollutant limits
- Pollutant limits considered tertiary



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

ALTERNATIVE TREATMENT TECHNOLOGIES

- Treatment Process Alternatives Considered
 - Parallel Conventional Treatment Process
 - Sequencing Batch Reactors
 - Membrane Bioreactors
- Membrane Bioreactors Selected as preferred alternative



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

MEMBRANE BIOREACTOR PROCESS

- Biological process utilizing existing basins with modifications
- Membrane units make up the filtration process
- Eliminates the need for secondary clarifiers
- Membranes may be installed in portion of aeration basin or in separate tank
- Small footprint
- Treats to tertiary limits



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

UPGRADE AND EXPANSION PLAN

- New Screening, Grit Removal and Influent Flow Measurement
- New Influent Pump Station
- Modifications to EQ Basin Piping and Transfer Pumping
- New Membrane Bioreactor System and modifications to existing aeration basins
- New UV Disinfection System
- New Post Aeration
- Upgrade and Expand Effluent Pump Station
- New Membrane Thickeners in Sludge Tanks
- Associated process piping, SCADA and Instrumentation, and electrical



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

PROPOSED PROJECT BUDGET

Item	Estimated Costs
<i>Estimated Construction Cost</i>	<i>\$11,220,000</i>
Contingency	\$2,244,000
Engineering Services	\$1,120,000
Technical Services	\$150,000
Legal and Administration	\$50,000
<i>Estimated Project Cost</i>	<i>\$14,784,000</i>



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

PROJECT SCHEDULE

<u>Event</u>	<u>Project Month</u>
Begin Final Design Phase	1
Submit Plans and Specifications for Approval	10
Secure Project Funding and Permits	12
Advertisement for Bids	13
Receive Bids	14
Award Construction Contract	16
Begin Construction	18
Complete Construction	34
Project Closeout	36



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects

PROJECT FUNDING

- State Revolving Loan (SRF) Fund
 - Rates currently @ 1.5 percent
 - Terms up to 30 years
 - Fixed Principal and Interest Payment
- Municipal Bond Market
 - Market rates and terms
 - Graduated principal payments in short term option
- ARC grant assistance up to \$500,000



SRF FUNDING CHALLENGES

- Project is low priority on the Program's Intended Use Plan
- Program funds becoming more limited
- Program becoming more competitive
- Program priorities adjusted still to favor projects that are ready to proceed with permitting and bidding.
- Funding cycle begins July 1 each year
- Recommendations
 - Meet with Program Officials at SCDHEC
 - Establish why the project is ranked low
 - Determine if ranking can be improved



PROJECT ENGINEERING SERVICES

- Engineering Services
 - Final Design
 - Bidding and Negotiation
 - Construction Administration
- Technical Services by others
 - Surveying
 - Subsurface Investigation
 - Materials testing
 - Building Code “Special Inspections”



QUESTIONS



CITY of CLEMSON, SC
IN SEASON, EVERY SEASON.



DESIGN SOUTH
PROFESSIONALS, INC.
engineers architects