Caroline County, VA

Caroline County selected the design build team of Reid Engineering and MEB General Contractors for the design build wastewater treatment upgrade and expansion project for Caroline County Polecat Creek Regional WWTP through the unsolicited PPEA process. The WWTP is being expanded from 0.5 MGD to 1.5 MGD and upgraded to provide enhanced nutrient removal.

The specific project included the following:

- All Related Engineering, including BioWin Modeling and Process Design
- New 8,000 sqft Operations Building, including SCADA Control Room and Lab
- New Septage Receiving Station
- Upgraded Influent Pumping Station
- New Headworks, Screening and Grit Removal
- Equalization
- 5 Stage Bardenpho Reactor Process for Enhanced Nitrogen and Phosphorus Removal
- Upflow Tertiary Filter System with Future Denitrification Capabilities
- Final Clarification
- Sludge Handling and Digestion
- Electrical and Genset
- Plant-wide SCADA System
- Beneficial Reuse
- Permits via VA DEQ
- Funding via Virginia Resource Authority (VRA)

Project Highlights: *Reid Engineering saved the County over* ***10 million dollars*** *based on a previous design and estimate by others. The County could not afford the project and, after it was denied stimulus funds, decided to entertain the value engineered design by Reid through the PPEA approach.*

The Earth is the Lord's...
Reid Engineering
Psalm 24:1

540-371-8500 ◆ www.ReidEngineering.com/Projects

City of Fredericksburg, VA

The City of Fredericksburg selected the design build team of Reid Engineering and English Construction via an unsolicited PPEA proposal for their wastewater treatment system improvements project, which included proposal development, all aspects of engineering including BioWin modeling and process design, new bar screen, new UV disinfection, and a new plant-wide SCADA System. The City's WWTP had a mandated consent order compliance schedule by the VADEQ, which warranted the design build approach.

The City of Fredericksburg also hired Reid Engineering to update the City's operation and maintenance manuals, perform a nitrogen removal upgrade evaluation and preliminary design to implement their pretreatment program which consisted of:

- Local Limits
- Pretreatment Ordinance, Application and Permit
- Enforcement Response Plan

The Earth is the Lord's...
Reid Engineering
Psalm 24:1

Town of Bowling Green, VA

Reid Engineering is the Prime Engineer for the design build utility project through the unsolicited PPEA process with the Town of Bowling Green. The Town had been working on the project on and off for over 10 years without making any real progress. Reid Engineering was able to present the value of the PPEA in terms of competitive cost, phased scope of work, and schedule, as well as having a guaranteed price the Town could take to the Property Owners and the Bank. Through the PPEA process the Town was able to solicit competitive design build proposals, obtain a guaranteed price based on chosen scope of work, gain approval from the Property Owners, create a special tax district and obtain funding through VML. The PPEA through Reid Engineering allowed the Town to save approximately 2 million dollars over estimates by others.

The specific project included the following services and components:

- PPEA Proposal and Guidance
- Preliminary Engineering Report
- WaterCAD Modeling
- Design of 4" – 9,000 LF Force Main
- Design of 8" – 6,700 LF Force Main
- Design of 8" – 3,400 LF Gravity Sanitary Sewer
- Design of 12" – 10,000 LF of Water Main
- Design of 550 LF of 15" Gravity Sanitary Sewer
- VDOT, VDH, DEQ and County Permitting

The Earth is the Lord's...
Reid Engineering
Psalm 24:1

540-371-8500 ◆ www.ReidEngineering.com/Projects

Town of Hurlock, MD

Reid Engineering was selected to design a cost-effective wastewater treatment facility after the Town of Hurlock's previous consultant had preliminary cost estimates that well exceeded the Town's budget. Reid Engineering was able to offer up value engineering and streamline the design so that the Town would save over six million dollars. Once again, the Owner found value in saving money for their community and looked to Reid for a cost-effective and innovative design that would meet the strict Chesapeake Bay nutrient limits. The result was a new 2.1 MGD 4 stage Bardenpho activated sludge reactor system followed by clarification, tertiary filtration, chlorination/dechlorination, sludge holding and handling, and post aeration. The WWTP was designed to meet enhanced nutrient removal (ENR) limits in the state of Maryland.

Reid Engineering was the Prime Engineer on the project, which consisted of the following services:

- Roadway Design and Permitting
- Stormwater Design and Permitting
- Grading
- Erosion and Sediment Control
- MDDEP Permitting
- Grant and Loan Services
- BioWIN Modeling
- Structural, Electrical, Civil and Mechanical Design of a New 2.5 MGD Bardenpho WWTP that will meet TN = 3 mg/l and TP = 0.3 mg/l
- Bidding and Construction Phase Services

The Earth is the Lord's...
Reid Engineering
Psalm 24:1

Town of Luray, VA

After several tries with other engineering firms, the Town of Luray hired Reid Engineering due to their unique design approach for the proposed nutrient upgrade for their existing 1.60 MGD oxidation ditch system.

Reid Engineering's services consisted of the following:

- Preliminary Engineering Report
- BioWIN Modeling and Process Design
- VA DEQ Permitting
- WQIF, VRLF and VRA Grant and Loan Assistance and Management
- Design WWTP Upgrade to meet Total Nitrogen = 4 mg/l and Total Phosphorus = 0.3 mg/l
- Bidding and Construction Phase Services
- Resident Project Representative
- O&M Manuals

A two-stage modified Ludzack-Ettinger (MLE) activated sludge process followed by denitrification/tertiary filtration was determined to be the most reliable and cost-effective means for complying with the nutrient removal objectives for the facility. The two existing oxidation ditch activated sludge basins were modified to operate in series as an MLE biological nitrogen removal process. The new jet aeration system was installed in each oxidation ditch to provide mixing and aeration, which is a unique feature to this design. The project also consisted of a new nitrate recycle pump station, new sludge pump station, one new secondary clarifier and upgrading of the existing clarifiers, a new continuous backwash up-flow denitrifying sand filters, new chemical storage and feed equipment and upgrade of SCADA system.