

February 22, 2019

Mr. Guy Nisbet, Supervisor
Department of Administration, Purchasing Division
2019 Washington Street East
Charleston, West Virginia 25305-0130

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WV PURCHASING
DIVISION

RE: Expression of Interest
Solicitation No.: CEOI 0310 DNR1900000004
A/E Services – Blackwater Falls State Park Wastewater Improvements

Dear Ms. Negley:

Rummel, Klepper & Kahl, LLP (RK&K) is pleased to respond to the West Virginia Division of Natural Resources (DNR) request for Expressions of Interest for A/E Services for Blackwater Falls State Park Wastewater Improvements project. As a leader in the industry, RK&K provides a full range service for wastewater improvement projects and systems serving public and private sector clients. Our services include all aspects of wastewater conveyance and treatment facilities. RK&K has assembled a team of highly-qualified professionals with experience in all phases of wastewater projects and are confident the team will meet the DNR's needs for this project. Forming a partnership with the DNR to identify needs, analyze alternatives and design a project that incorporates cost-effective strategies, all while meeting the specific requirements of DNR. This formula for success is based on RK&K's broad experience providing engineering design services related to wastewater systems for clients large and small.

RK&K's extensive experience providing engineering services, technical oversight and support during construction, translates to innovative, constructible and cost-effective project performance. Our team offers strengths that set RK&K apart from other firms submitting on this project.

- **Small Firm Responsiveness, Large Firm Resources.** Though RK&K is a firm with over 1,350 employees, RK&K has remained focused on small firm roots and is dedicated to exceptional client service. RK&K has a multidisciplinary local team of 25+ staff members located in Keyser, West Virginia office, available to serve DNR on this project.
- **Experienced Project Managers.** RK&K's project managers are well acquainted in management of this type of project, with decades of relevant wastewater utilities design experience along with successfully designing similar wastewater projects. RK&K's management team places great emphasis on identifying cost effective solutions based on accurate cost estimates.
- **Specialized Subconsultant.** RK&K anticipates providing all work associated with this project; however, Montum Architecture, LLC will serve as a subconsultant to RK&K if the need is determined. Tom Pritts, AIA, owner brings more than 15 years of experience in this field, including several current and successfully delivered projects for DNR.
- **Responsive Service.** Due to the proximity of the Keyser, West Virginia office, the RK&K Team can expedite the response time during the design and construction phases of this project. Providing responsive service is a top priority. DNR can count on RK&K's team to be very accessible.
- **Commitment to DNR.** RK&K will work alongside DNR representatives and utilize a proven, efficient and effective approach to meet the project objectives. RK&K is committed to working with DNR to meet the needs of this project.

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- **Ability to Begin Immediately.** RK&K's team can begin work on the project immediately and has the available resources to meet the DNR's desired schedule. Project success will be the focus of the RK&K Team, providing on-time and on-budget delivery of services.

RK&K appreciates this opportunity to demonstrate our outstanding technical capabilities in providing engineering services, team innovation, and unparalleled project commitment. The RK&K Team is enthusiastic about the opportunity to serve DNR on this important project and welcomes an opportunity to meet with the selection committee to discuss the project in more detail. If you have any questions regarding this proposal, please feel free to contact me at 304.788.3370 or e-mail jcole@rkk.com.

Very truly yours,

Rummel, Klepper & Kahl, LLP

A handwritten signature in blue ink, appearing to read 'John W. Cole', written over the typed name.

John W. Cole, PE
Manager, Municipal Engineering

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(l), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Rummel, Klepper & Kahl, LLP

Authorized Signature: [Signature] Date: 2/8/19

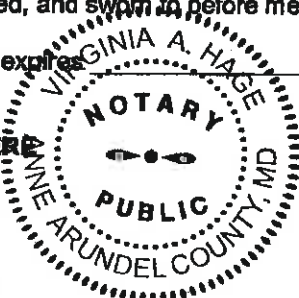
State of Maryland

County of Anne Arundel, to-wit:

Taken, subscribed, and sworn to before me this 8th day of February, 2019.

My Commission expires 4/7, 2020

AFFIX SEAL HERE



NOTARY PUBLIC [Signature]
Purchasing Affidavit (Revised 01/19/2018)

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EXECUTIVE SUMMARY

Introduction

The Executive Summary provides a synopsis of the various components of RK&K's Expression of Interest (EOI) as well as our ability to fulfill the contract requirements to successfully deliver design services and construction contract administration services to the West Virginia Division of Natural Resources (DNR) for renovations to the old cabins wastewater plant and collection systems at Blackwater Falls State Park located in Tucker County, West Virginia. Our proposed team for this project is committed to deliver engineering solutions that are technically-sound, cost-effective and environmentally compliant.

Statement of Qualifications

Section 2, Statement of Qualifications, describes RK&K's more than 96 years of expertise in providing professional services for the study, design, construction and project delivery for all aspects of water and wastewater utility systems. This industry expertise makes RK&K a reliable partner to fulfill DNR's needs for this project. Our firm has been involved in numerous studies to evaluate the adequacy and condition of existing facilities, develop and evaluate alternatives for new facilities that best meet current and future needs of client's water and sewer utilities; and identify and recommend the best program for managing the water and sewer systems development and growth in a planning area for a specified planning horizon. RK&K also routinely provides preliminary engineering and designs, final design, development of contract documents for new construction, rehabilitation, replacement and construction inspection/administration services for wastewater improvement projects.

Section 2 also describes the **Capacity of the Firm**. RK&K has projects in varying stages of completion and our team's current workload will have no impact on our ability to provide services to DNR for the successful delivery of this project. Our firm maintains a healthy and manageable workload and are vigilant about responding promptly to the satisfaction of our clients. Based on the current and projected workloads of our team, RK&K can fully commit all necessary resources to facilitate the successful, timely delivery of professional engineering and related services to DNR. This project will be led from our Keyser, West Virginia office which includes + dedicated staff available to begin this project upon notice to proceed. Additionally, RK&K has more than 1,350 engineers, designers, and support staff available to support Keyser's staff to meet schedules as required.

This Section also describes **RK&K's Related and Past Experience** delivering projects with similar requirements and schedules. Because of our depth of staff, and our familiarity and proven approach delivering similar projects, we are confident in our ability to meeting DNR's needs for this project. Our Experience with the **Requirements of State and Federal Agencies** is also described as well as our Team's **Technical Expertise** related to wastewater systems.

RK&K's West Virginia Certificates of Authorization are included at the end of this section.

Methods of Approach

Section 3, Methods of Approach, describes RK&K's understanding and the various phases of our approach to deliver this project. It is our understanding DNR is seeking a professional engineering firm to provide necessary engineering and related professional services to design and specify for construction as well as provide construction contract administration, for Renovations to the old cabins wastewater Plant and collection systems at Blackwater Falls State Park. We understand the planned improvements may also include additional work throughout the Park and as necessary for, or related to, the park facilities, as well as any other necessary ancillary work.

Management and Staffing

Section 4, Management and Staffing, describes our project team proposed for this work. We offer DNR a team of professionals who are well versed in the wastewater industry for this project. Our team consists of professional engineers licensed in the State of West Virginia with a sound knowledge of standards and design requirements. The team will be led by **John Cole, PE**, Project Manager offering 17 years of diverse experience in the wastewater industry, including wastewater treatment plants, pumping stations, and collection systems, as well as construction management. Mr. Cole will lead a group of highly qualified individuals with vast knowledge and experience who have worked together on prior wastewater projects.

Mr. Cole will be the point of contact for DNR for all communications related to the project, ensuring that all project team members receive design directives.

Section 4 also includes **RK&K's Management Approach and Quality Assurance process**. We have also included a detailed organizational chart identifying each key team member and their proposed project assignment. In addition, resumes of key team members are provided, which include a copy of the key team member's professional staff licenses.

RK&K will also utilize the services of **Montum Architecture, LLC** as subconsultant for architectural services on this project. Thomas Pritts, AIA, owner, brings more than 17 years of experience to this project, as well as current and past work with the DNR.

Experience with Similar Projects

Section 5, Prior Experience contains RK&K's qualifications, experience and references. Our proven track record is evidenced by high ratings and repeat business from a variety of clients. This reputation has allowed RK&K to provide repeat services to many West Virginia clients and agencies. The experience and expertise our staff has gained from projects with these clients is directly applicable to the services for the Blackwater Falls State Park Wastewater Improvements project envisioned by DNR. As demonstrated on our project profiles included in this section, RK&K has garnered a vast amount of experience working on similar projects spanning decades. This diverse engineering expertise has led to an extensive list of successful projects and repeat clients, and is a testament of RK&K's ability to deliver the Blackwater Falls State Park Wastewater Improvements project to DNR on schedule and in the most efficient and cost-effective means possible.

OVERVIEW OF THE FIRM



Founded in 1923, Rummel, Klepper & Kahl (RK&K) is a leader in providing the full spectrum of planning, engineering and construction services to water and wastewater agencies and municipalities throughout the mid-Atlantic and Southeastern Regions. Our services include all aspects of water quality and quantity management ranging from water and wastewater treatment plants, wastewater collection and water distribution systems, and pumping stations. Adept at a diverse mix of water system projects, our engineering team possesses expertise in hydraulics, hydrology, infrastructure planning, project management, and construction administration.



Ranked #73 on the 2018 Engineering News Record's listing of Top 500 Design Firms, RK&K

serves an array of municipal, state and federal clients from 25 offices, including two in West Virginia – Keyser and Charleston. The firm employs a well-diversified staff of engineers, planners, environmental specialists, surveyors, designers, draftsmen/CAD technicians, GIS specialists, construction managers, inspectors and support staff.

PROFESSIONAL SERVICES

RK&K's services include preliminary engineering studies/reports, environmental and qualifying reviews, surveys, preparation of funding applications, final design, preparation of bidding and contract documents, participation in the evaluation of construction bids and construction management and inspection services.

CAPACITY OF THE FIRM

Services for the Blackwater Falls Wastewater Improvements project will be offered from RK&K's Keyser office, which includes 25+ dedicated staff. When additional specialty resources are needed, manpower of 1,350+ engineers, designers, technicians and support staff will be utilized to support the work.

RELATED PRIOR EXPERIENCE

RK&K is knowledgeable of Tucker County's local conditions, and is well versed on West Virginia codes, ordinances, and regulations for water system design projects. Section 5 of this submission provides profile sheets depicting RK&K's relevant and applicable experience.

RK&K has an abundance of experience in providing engineering services for wastewater system improvement projects for small county and local governments, including municipalities who might not have the benefit of an engineering staff. RK&K's vast experience in all aspects of wastewater system design has included completion of studies for new systems; evaluation of existing facilities; recommendation of improvements; preparation of preliminary engineering reports and funding applications; assistance to the client in securing funding for a project; design and preparation of plans and specifications; and assistance to the client in bidding and award of a contract. Further, RK&K has provided construction engineering and inspection services during construction, including assistance to clients in project closeout.

In-House Services	
Water/Wastewater	GIS, Survey & Mapping
Water Resources	Geotechnical Engineering
Civil/Site Development	Natural & Cultural Resources
Transportation Planning & Engineering	Natural Gas, Petroleum & Pipeline Engineering
Traffic Engineering	Value Engineering
Structural Engineering	Landscape Architecture
Environmental Services & Permitting	Construction Management & Inspection

TECHNICAL EXPERTISE

RK&K's environmental/sanitary engineering experience covers planning, design and construction management for all aspects of wastewater systems. The firm has achieved great success in water/sanitary and environmental engineering, placing numerous wastewater projects into successful operation. RK&K has been involved in numerous studies to evaluate the adequacy of existing facilities and to develop and evaluate alternatives for new facilities that best meet the current and future needs of clients.

RK&K has an abundance of experience in providing engineering services for wastewater system projects.

Wastewater Systems

RK&K can attest to over 96-years of achievement in the field of civil/sanitary engineering, focusing on planning, study and design services for numerous wastewater conveyance systems that have included over 200 interceptor sewers, conventional gravity and low-pressure sewers, parallel relief sewers, and force mains. These projects have involved pipelines ranging from 8- to 108-inches in diameter constructed of ductile iron pipe (DIP), pre-stressed concrete cylinder pipe (PCCP), reinforced concrete pipe (RCP), polyvinyl chloride (PVC), high density polyethylene (HDPE), centrifugally-cast fiberglass mortar, clay, steel and cast-in-place conduits to 22-feet in diameter. Pipeline installation conditions have varied from conventional trenches with pile bent, cradle, or indigenous material foundations to subaqueous crossings including horizontal directional drills, to bridge suspensions and tunnels. Boring and jacking of the roadway and railroad at pipe crossings is frequently an aspect of work.



Town of Oakland – Sewer System Replacement

RK&K has provided design services for corrosion control, including adjustable impressed current and passive sacrificial anode cathodic protection systems as well as polyethylene wrap protection for ferrous pipelines and PCCP systems as required. Our team has also provided design for reinforced concrete conduits, both plastic liner and special construction materials with sacrificial barrel design where a corrosive hydrogen sulfide environment was anticipated. For relief of parallel sewers, RK&K's team has assisted in the design of hydraulic interconnection and balancing structures between the existing and relief sewers.

Further, RK&K has been involved in many projects requiring special investigations and rehabilitative design where existing interceptors and force mains either have structural damage that compromises the integrity of the sewer system or have conditions that limit the necessary flow through the pipe. Investigative efforts have involved SSES tasks such as televising the interior of pipelines, obtaining and inspecting core samples of pipe walls, smoke and dye testing to identify in-flow sources, inspecting for pipe wall failure or deformations, pipe movement, joint separation, corrosion, erosion, scouring and tuberculation. This type of work has also included analyses of rehabilitative alternatives and preparation of rehabilitative plans and specifications. These analyses usually include a comparative evaluation of in-situ repair methods versus a more traditional approach of excavation and pipe replacement. Excavation and pipe replacement often have higher costs and may present construction and safety challenges as compared with in-situ methods. In-situ methods such as sliplining with HDPE pipe, inflating a resin-impregnated felt and polyethylene tube within the sewer to create a permanent liner, and chemical grouting are effective methods to improve the structural condition and carrying capacity of a pipeline.

Most of this work has involved design to maintain services while the pipeline was being repaired. RK&K has also been involved in emergency design for projects where changed field conditions or erroneous record documents have required modifications to contract documents.

Wastewater Pumping Stations

RK&K's specialized experience in wastewater pumping station studies and design has involved both new and upgraded existing facilities. Among the numerous wastewater pumping stations planned and designed by RK&K are examples of high-, medium-, and low-head facilities employing horizontal and both close-coupled and extended-shaft vertical pump configurations, as well as submersible and dry-pit submersible pumping units. Auxiliaries have included comminution, mechanical screening, grit collection and washing; oil accumulators and hydropneumatics systems; compressed air, chlorine, hydrogen peroxide, and ferrous sulfate feed for hydrogen sulfide control; activated carbon and ozone wet well air quality control; soil odor filters; packed tower chemical scrubbers; heating, ventilation, and dehumidification systems; emergency standby generators; and dual power supply systems.

Many assignments have involved the examination, testing and evaluation of existing pumping stations, and development of remedial designs for improvement, upgrade, relief or replacement. RK&K reviews each project site and scope in detail to determine any potential issues that may become present during the design and construction. As such, some of these issues which have been successfully addressed, include, but are not limited to:

- Modifications of pump motor speed, horsepower, and impeller size to achieve increased capacity and head.
- Interception of wet weather flows and associated abrasive grit.
- Sequences of construction and operation to maintain existing wastewater pumping capacity during construction, testing, and station piping change-over.
- Modifications of pump materials, motors, instrumentation, and other appurtenances.



Virginia Beach Public Utilities



Frankfort PSD – Regional Sewer System

Wastewater Treatment Facilities

RK&K has completed more than 100 wastewater treatment assignments, including the design of new treatment and pre-treatment systems, rehabilitations, expansions, upgrading, and process-modification systems. System and process capacities have ranged from 0.02 to 180 mgd and have been designed for a broad spectrum of sanitary and combined sanitary and industrial waste loads. Additionally, RK&K has successfully completed more than 30 significant industrial wastewater treatment assignments in the mid-Atlantic and Southeastern Regions.

Force Main/Interceptor Rehabilitation or Replacement

RK&K has provided services for projects requiring special investigations and rehabilitative design where existing interceptors and force mains either have structural damage that compromises the integrity of the sewer system or have conditions that limit the necessary flow through the pipe. Investigative efforts have involved SSES tasks such as televising the interior of pipelines, obtaining and inspecting core samples of pipe walls, smoke and dye testing to identify in-flow sources, inspecting for pipe wall failure or deformations, pipe movement, joint separation, corrosion, erosion, scouring and tuberculation.

This type of work has also included analyses of rehabilitative alternatives and preparation of rehabilitative plans and specifications. These analyses usually involve a comparative evaluation of in-situ repair methods versus a more traditional approach of excavation and pipe replacement. Excavation and pipe replacement often have higher costs and may present construction and safety challenges as compared with in-situ methods. In-situ methods such as sliplining with HDPE pipe, inflating a resin-impregnated felt and polyethylene tube within the sewer to create a permanent liner, and chemical grouting are effective methods to improve the structural condition and carrying capacity of a pipeline. Most of this work has involved design to maintain services while the pipeline was being repaired.

Hydraulic Modeling

Evaluating an existing system, identifying problem areas, assessing the merits of recommended improvements or planning a proposed system, sewage force main systems and sanitary and combined sewer systems with computers is a proven, effective, and reliable technology for simulating and analyzing system behavior under a wide range of hydraulic conditions. RK&K uses various modeling software, depending upon the needs of the utility. RK&K has provided modeling support for many counties and municipalities in West Virginia and in neighboring states, as well as private utilities and institutions, including Greater Marion PSD, Central Hampshire PSD and the City of Romney. The bulk of RK&K's experience involves WaterCAD by Haestad Methods for water distribution and force main systems and XP-SWMM2000 by XP Software for combined and sanitary collection systems.



Horizontal Directional Drilling

RK&K has performed Horizontal Directional Drilling (HDD) services for numerous clients across the country. Over the last ten years, the firm has completed more than two hundred HDD projects ranging from road crossings to over 7,000-foot water crossings. RK&K's staff is experienced in all phases of HDD assessment, design, permitting, construction management, inspection and training. Our staff provides a practical approach to the feasibility, design, and construction of HDD installations. The engineering services include technical and economic feasibility assessments, production of detailed reports, geotechnical assessments, designs, specifications and drawings, engineering support for contractors, and construction management/inspection for HDD Projects.

RK&K occupies a key position in the application of HDD to cross obstacles such as waterways and roads. Our representatives understand the downhole survey system being utilized by the project's contractor. We interpret readings and perform independent calculations determining the position and curvature of the pilot hole. Drilling fluid returns at the entry and exit point are calculated to correlate with each specific design challenge. We also provide recommendations to the client and contractor related to the drilling fluid program.

SUPPORT SERVICES FOR WASTEWATER SYSTEM FACILITIES

Structural Engineering

RK&K offers experienced structural engineers capable of providing the services required for this project. Our structural engineering staff is well qualified in performing all phases of work, commencing with concept and feasibility studies through final design and construction phase services. With an extensive background in municipal facility projects, examples of structural services include well houses, treatment plants, pumping stations, storage tanks, utility tunnels and vaults, retaining walls, drainage structures, operations facilities, fuel handling facilities, and chemical storage facilities.

Mechanical Engineering

RK&K's mechanical design experience includes HVAC, dehumidification, piping, flow monitoring and valving systems for water and wastewater treatment plants and pumping stations; compressed air and odor control systems for treatment plants and pumping stations; and plumbing systems for various facilities. Automatic temperature and ventilation controls are designed in accordance with accepted code requirements for air change frequency and to maintain the comfort of operations and maintenance personnel. All mechanical equipment requirements are carefully accounted for when interfacing with the main facility control systems.

Electrical Engineering

RK&K has the in-house capabilities to design all types of electrical power distribution and control systems for municipal, industrial and transportation type construction contracts. The firm has provided complete design and construction phase services for various types of facilities throughout the mid-Atlantic region. These facilities include water and wastewater treatment plants, pumping stations, well houses, and natural gas regulating stations.

Designs have included low and medium voltage switchgear, complete power distribution systems, motor control centers, pump controls, HVAC controls, standby emergency power generator systems, SCADA systems and lighting systems of all types.

Geotechnical Services

The RK&K geotechnical engineering department has been involved in the field investigations, analyses, and geotechnical report preparation for various municipal engineering facilities in excess of 30 years. During this period, numerous treatment plants, pumping stations, solid waste disposal facilities, earth and rock fill dams, levees, floodwalls, lagoons, water supply wells and water supply reservoir projects have been investigated and final designs prepared. In addition, remedial measures and upgrades of existing facilities have been analyzed and geotechnical input provided for final design. For these projects, test borings and observation wells have established soil, rock, and groundwater conditions at the site which, when used in conjunction with laboratory test results where required, has resulted in the most practical foundation system or rehabilitation measures for the project.



Charles Town Water Treatment Plant



Frankfort Public Service District

Instrumentation/Control and SCADA Systems

RK&K has extensive experience in the evaluation and design of instrumentation and control systems of all types. RK&K has designed numerous water pumping facilities based on level control and pressure control for single and multi-pump applications ranging from a few horsepower to several hundred horsepower. Control systems utilized have included pre-engineered relay-based systems, custom designed relay-based systems, pre-engineered digital control systems, and custom designed systems using programmable logic controllers (PLCs). In each case, control systems have been integrated with the necessary alarm, telemetry and SCADA functions required for the application.

Many of the systems designed have included the use of variable frequency drives to control pump speed, including customized multi step speed controls to limit piping fluid velocities under specific operating conditions. In most cases, RK&K's designs have included some level of back up control, ranging from redundant level/pressure sensing equipment, to full back up secondary controls providing automatic operating in the event of primary control failure. Other functions implemented in the design of pump control systems have been automatic valve timing/sequencing, seal water systems, automatic pump alternation, pump lockout circuitry, motor thermal monitoring and vibration monitoring. RK&K's involvement in the design of pumping control systems is often extended into the construction phase of a project, where troubleshooting and start up services have been provided to aid in the implementation of the design.



Operation and Maintenance and Start-up Services

RK&K's experience with operation and maintenance associated with water, wastewater and stormwater facilities includes a wide range of capabilities and services. These consist of training of client staff and operators; preparation of detailed O&M manuals and standard operating procedures; plant evaluation, performance testing, and troubleshooting; and facility startup. RK&K is an innovator in the design and delivery of customized training programs for O&M personnel, many of which are often developed to address client specific concerns for facilities already in operation. RK&K has developed comprehensive SOPs, standard maintenance procedures, operator pocket guides, emergency response plans, operating placards, and other information for plant personnel. In addition, our team provides recommendations to improve plant performance, energy and chemical system optimization, structural integrity and design life and equipment operation and reliability.

Regarding inventory management and control for municipal water, wastewater and stormwater facilities, RK&K often institutes as part of the O&M manual or standard operating procedures, a facility specific protocol for managing spare parts inventories, lubricants and equipment specific tools. These protocols are usually developed in conjunction with the client's operation and maintenance staff and can range from a three-ring binder containing the inventory listing, parts, identification numbers, and vendor codes to a complete computer database installed on a networked hardware system with terminals accessible at various system facilities.

ENGINEERING SUPPORT SERVICES

Permitting

RK&K has extensive experience and close working relationships with numerous federal and state environmental agencies to obtain required permits. Through recent experience on projects for municipalities, RK&K's Team has developed a close working relationship with the WV Bureau of Health, WV Department of Environmental Protection; WV Department of Natural Resources Office of Land and Streams; WV State Historic Preservation Office; as well as US Fish and Wildlife and Army Corps of Engineers.



Environmental Assessments

The RK&K Team includes individuals experienced in identifying jurisdictional waters of the U.S., including the vegetation, soils and hydrology for wetland delineations. Several key and support staff members are U.S. Army Corps of Engineers' (COE) certified wetland delineators and/or professional wetland scientists. RK&K can assess functions and values of affected wetlands using techniques such as the Hollands Magee method, Soil Conservation Service Method, Hydrogeomorphic Classification method (HGM) Rapid Assessment Procedure (Magee Hollands Method) or other accepted methods.

RK&K has conducted several hundred wetland delineations and numerous functional assessments. Wetland delineations are performed in accordance with the 1987 COE Manual and have been approved by, and jurisdictional determinations have been obtained from various COE districts, including Baltimore and Norfolk.

RK&K includes professionals skilled in delineating and documenting stream conditions (physical and biological), submerged aquatic vegetation habitat and water quality conditions. RK&K has experience using a variety of methodologies for characterizing stream conditions including Rosgen Stream Classification, U.S.D.A.'s Stream Visual Assessment Protocol and EPA's Rapid Bioassessment Protocols.

Our team also has extensive experience in preparing ecological technical reports which include biological assessments prepared in compliance with the Endangered Species Act.

Construction Management/Inspection Services

RK&K's Construction Management and Inspections Department has been providing construction phase services for over 50 years involving hundreds of public works' projects with aggregate construction costs in the billions of dollars. Projects include water and sewer infrastructure, water and wastewater treatment plants, pumping stations, stormwater management, roadways, bridges, transit tunnels, subways, hydroelectric plants, marine facilities, and flood control facilities plus a variety of building projects. Many projects involve a full range of construction management/administration and inspection services from design, preconstruction, construction and post-construction phase, including materials testing, tests and start-up, claims resolution, CPM scheduling and contract close-out. RK&K's construction engineering and inspection services involve public works, capital improvements, transportation and/or development projects.

RK&K employs hundreds of construction engineering/inspection personnel of varying levels of expertise. RK&K's employees are knowledgeable about traditional as well as state-of-the art construction inspection practices and procedures and materials testing techniques. Many of RK&K's staff are NICET-certified, Troxler nuclear gauge trained, hold state erosion and sediment control certifications, are certified or approved by client's materials laboratories, and have solid backgrounds and expertise in field surveying and construction layout.

Cost Estimations

RK&K's cost control plan focuses on both internal cost and assignment schedule as well as the construction cost of the facilities being designed. RK&K maintains a monthly routine of monitoring and updating project costs. RK&K's in-house accounting system provides timely reports so that project/task managers know where they are from a budget standpoint on a real-time basis. As a quality





PROJECT UNDERSTANDING

RK&K extends appreciation to **Matthew Baker**, Park Superintendent, **Terry White** and **Steve Burns** for providing a tour of the existing system, and to **Kenneth “Scott” Hebb** for providing an overview of the treatment operating system.

RK&K is aware that the Old Cabins WWTP has a permitted flow of 6,100 gpd and that the gravity collection system serving the treatment facility has a severe inflow and infiltration (I&I) problem. We also understand that mapping is not available of the existing collection system, and operators have only a general idea on the overall sewer alignment and construction material. In addition, manholes do not exist along the 6” terracotta sewer alignment between the cabins and the WWTP.

The existing Old Cabins WWTP consists of two 1,000-gallon septic tanks, recirculating sand filters and UV disinfection. Sewage entering the treatment plant enters the septic tanks where the solids/liquids are separated. The liquid then flows by gravity to a recirculation tank where it is then pumped to one of four separate recirculating sand filters prior to UV disinfection. The accumulated solids within the septic tanks are periodically pumped out and hauled offsite for disposal. According to Mr. Hebb, the recirculating sand filter tanks have never been cleaned or had the media replaced. Currently, the filtration capacity is severely hindered by accumulated solids.

According to Mr. Hebb, the hydraulic capacity of the WWTP is essentially at the permitted capacity. The 1½” discharge line from the UV Unit usually runs full, and at times the filters begin retaining water as the discharge is limited by the line.

One of RK&K’s initial efforts will be to meet with DNR to develop system mapping that can be used to prepare an I&I investigation and/or system evaluation.



COMMUNICATION PROCEDURES

At RK&K, we believe proactive communication with your staff is as important as interdepartmental coordination within our firm. For this reason, our team will collaboratively work with representatives from DNR deliver a cost-effective, detailed design that fits the specific needs of Blackwater Falls State Park Wastewater Improvements. We offer DNR an integrated project approach that begins with working closely with your representatives to comprehend a full understanding and the project goals.

This interactive and collaborative process will be led by our Project Manager, **John Cole, PE**. From project initiation to project closeout, he will serve as the main contact, make sure that consensus is reached at each phase and that the design solutions developed are responsive to DNR’s goals and project needs.

PERFORMANCE DATA

One of the primary reasons we staff a project the way we do is to populate the project team with readily available and qualified personnel. This team is no exception – each person was chosen based on their experience and performance providing services on similar wastewater improvement projects. Our team is comprised of engineers, CAD designers, surveyors, and resident project representatives ready to begin work immediately and capable of performing the tasks required to meet DNR's goals and objectives. We have organized our team to ensure that we have the staff and resources to facilitate the successful, timely delivery of engineering services for a successful project. RK&K's resources, including staff and equipment are at the disposal of our project team as schedules and assignment workloads require. Our success is achieved by implementing a proven staff and work plan which focuses on: effective project management to achieve DNR's objectives and rapid responses—including proactive management of costs; providing a skillful team with the requisite expertise to provide the services requested; clearly understanding the work to be performed and the expected outcomes; establishing and implementing robust QC/QA protocols; and optimizing the allocation of resources to meet schedules.

PROJECT GOALS AND OBJECTIVES

We have assembled a team from our Keyser office to be responsive to each item within the scope of work involved with this project. As such, our team is equipped to work concurrently to deliver high-quality projects, on-time, and within budget. Each team member is ready to begin immediately and will work objectively to create a desirable end result for the wastewater improvements at Blackwater Falls State Park that truly incorporates DNR's vision and goals. Our proposed team is known for its technical know-how and over the top personal service.

Goal/Objective 1: Review of Existing Plans and Conditions

The RK&K Team will begin by gathering all available information on the DNR's sewer system. RK&K acknowledges that effective communication is the key to success. Meetings will be conducted at the park facility for discussion and with DNR representatives to determine a plan that can be applied with minimal disruption to the park, staff, guests and operation of the facility, while meeting the intention of the project.

Goal/Objective 2: Design Services

RK&K will provide all necessary services for the design of the project. Construction plans and specifications will be developed in accordance with current federal and state laws and codes and will be combined with the bidding and contract documents necessary to advertise the project for bid. During the design process, the RK&K Team will continue to meet frequently with DNR representatives to review progress and receive input.

Budget and Schedule Control: RK&K has an exceptional record of completing projects on time and within budget. RK&K's in-house cost accounting system is capable of segregating and identifying accumulated costs for this project. We will utilize this system to make sure that the project is designed and executed within budget.

Quality Assurance/Quality Control: RK&K's in-house quality assurance/quality control program will also be utilized to make sure that all documents are complete, accurate, and concise.

Goal/Objective 3: Construction Contract Administration Services

RK&K will provide the necessary contract administration services to make sure that the project is constructed in compliance with plans and specifications. Project Manager, Mr. Cole, will serve as the communication link between DNR and the contractor. He will conduct monthly progress meetings with the contractor and DNR to review progress and to resolve any problems that may arise. At the completion of the project, he will conduct a walk-through inspection with DNR's representatives and the contractor, prepare a punch list of items needed to be completed and conduct a final inspection after work is complete. He, along with our team members, will provide technical assistance during the one-year warranty period to resolve any problems that may occur.

With concurrence from the DNR, RK&K will provide full-time inspection on the project. RK&K employees are knowledgeable about traditional as well as state-of-the-art-construction inspection practices/procedures and materials testing techniques. DNR will be provided the opportunity to approve the inspector recommended by RK&K for the work. The inspector will provide assurances that the project is completed in accordance with the plans and specifications.

ANTICIPATED CONCEPTS AND METHODS

Typical Approach

RK&K's project approach has been utilized successfully on many wastewater improvement projects with requirements similar to those needed for the Blackwater Falls Wastewater Improvement project. This project will be led by an experienced team who have sufficient experience related to the services required for the successful delivery of this project. All work will be done in accordance with applicable federal, state and local regulations, including funding agencies involved. RK&K's typical methods of approach is outlined below and will be customized as needed to meet DNR's specific requirements.

System Study

The RK&K Team will begin by gathering all available information on the Lodge Wastewater Plant and Collection systems at Blackwater Falls State Park, such as reviewing relevant existing plans. RK&K will follow the reviews by meeting with DNR's operators, managers and others to obtain information.

After the initial discussion and reviews are completed, the team will meet with DNR's representatives to present findings and preliminary recommendations for the project. In addition to presenting the results of the study, RK&K will solicit input from DNR at this or subsequent meetings. These meetings are essential to everyone's understanding of the system's needs and the resultant proposed project. These meetings also serve to reduce or eliminate future misunderstanding of the work to be completed.

Engineering Report

RK&K will proceed with development of a Facility Plan. This report is the first requirement in developing a sewer project to delineate project details. The report will include project description, and project cost estimate necessary to present the project to DNR. Upon completion of the facility plan, RK&K will submit to DNR for review and approval.

Construction Plans and Specifications

Once the project is fully defined, the RK&K Team will proceed with the development of construction plans and specifications. The plans and specifications will be prepared to support the various phases of the project. Upon completion, the plans will be combined with the bidding and contract documents necessary to advertise the project for bid. The plans will provide a detailed description of the work to be completed by the contractor. The plans will be supplemented by detailed specifications defining the method of completing the work and the material specifications. RK&K's detailed specifications have been refined over years of working within the State, incorporating the lessons learned from similar wastewater improvement projects.

During the development of the contract plans and specifications, the RK&K Team will meet frequently with DNR to review progress and receive input. Normally, plans for owner and regulatory agency review and comment are submitted at 60%, 90% and 100% completion status.

Preparation of Bidding and Contract Documents

With completion of the plans and specifications, we prepare contract and bidding documents in anticipation of advertising the project for bids. This complete package will be used to define the project requirements from a contractual perspective for uniformity of requirements among all contractors.

Assembly of the contract and bidding documents completes the project package. While many of these documents are determined by funding agency requirements, RK&K will use the Engineers Joint Contract Document package as the basis of the contract documents.

The Engineers Joint Contract Documents Committee (EJCDC) is an undertaking of the American Consulting Engineers Council (ACEC), the American Society of Civil Engineers (ASCE) and the National Society of Professional Engineers (NSPE). EJCDC has developed and periodically updates a set of documents representing the latest and best thinking of practicing engineers and legal counsel on contractual relations between the parties involved in construction-related projects. These documents have been endorsed and recommended by the various funding agencies in West Virginia.

The EJCDC documents are standard contract documents utilizing carefully drawn language to define the respective responsibilities of the parties with respect to construction related projects based upon “test of time” experience. These documents are the industry model for professional engineering services and construction processes. The documents spell out accepted division of duties and responsibilities of the Engineer, Owner and Contractor and represent the culmination of legal precedent and expert review.

Following preparation of the complete construction document package, updated permits will be obtained from the Department of Health, Department of Environmental Protection and other applicable entities before going to bid. All necessary rights-of-way or easements must be acquired. RK&K will prepare the permit applications for DNR’s submittal. RK&K will provide any technical assistance required during the review process. RK&K is licensed to survey and prepared to assist the DNR in securing easement(s) and right-of-way(s). Although these approvals are straightforward, they will take time. All of this is dependent on the source of funding for the project.

Upon obtaining the construction permits from the applicable entities and permission from funding agencies and Public Service Commission, the project will be ready for advertisement.

Bidding Phase Assistance

With approval of DNR, the project can proceed to bid advertisement. A contract of this scope of work is normally advertised for three to four weeks to allow sufficient time for contractors to assemble prices and prepare a competitive bid. During that time, RK&K will conduct a pre-bid meeting with the contractors to review the project and answer any questions. An addendum will be issued as necessary to clarify any element of the project.

The project will be advertised for bids in accordance with state law and agency requirements. Projects are normally advertised in the local and regional newspapers. Advertisement in the Charleston or adjacent newspapers is also recommended to reach a wide audience of contractors. In addition to the newspapers, plans will be placed with Dodge Reports, West Virginia Contractors Association and other plan rooms in the West Virginia area. The objective is to alert as many contractors as possible and increase competition towards securing a low bid for the project.

At a specified date and time, bids will be collected at a designated location. RK&K will then assist DNR in opening and reviewing bids. The apparent low bidder will be announced at the end of the meeting.

Participation in the Evaluation of Bids Received

After the bids are opened, RK&K will review each submittal package in detail. This review includes verifying that the math is correct; verifying that all documentation required is satisfactory. Some of these requirements are initially checked at the bid opening; and evaluating the contractors’ ability to accept and satisfactorily complete the project. This could include evaluation of financial assets, current workload, previous projects and discussion with previous clients and engineers who have worked with the contractor.

After the comprehensive review is completed, RK&K will make a recommendation to award the contract to the selected contractor. At this stage of the project, RK&K will prepare the NOTICE OF AWARD and CONTRACT AGREEMENT to send to the contractor. After the contractor signs the contract agreement and returns it along with the payment and performance bonds and any other required documents, RK&K will issue, with DNR approval, a NOTICE TO PROCEED. A contractor normally has ten days to begin construction after receipt of this notice.

Monitoring and Inspection of Construction Activities

RK&K will serve as the communication link between DNR and contractor. Shop drawings and submittals furnished by the contractor will be reviewed by RK&K for compliance with plans and specifications. The Project Manager will monitor construction, visiting the site as often as necessary as the project proceeds.

RK&K's Project Manager will conduct monthly progress meetings with DNR and the contractor to review the project's progress. The Project Manager will also review the contractor's pay requests to verify quantities and recommend payment for work completed. At the completion of the project, RK&K will conduct a walk-through inspection with DNR and contractor, prepare a punch list of items needed to be completed and conduct a final inspection after work is complete. RK&K will also provide technical assistance during the one-year warranty period to resolve any problems that may occur. Near the end of the warranty period, RK&K will conduct a final inspection of the facility with the DNR. Any problems or defects noted will be sent to the contractor for correction.

RK&K will provide full-time inspection on the project, if desired by DNR. RK&K employees are knowledgeable about traditional as well as state-of-the-art-construction inspection practices/procedures and materials testing techniques. DNR will be provided the opportunity to approve the inspector recommended by RK&K for the work. The inspector will work to confirm that the project is completed in accordance with the plans and specifications. The project inspector will be provided with all necessary assistance from RK&K's project manager to make sure the project is completed in accordance with the plans and specifications.

Construction Plans and Specifications

Once the project is fully defined, the RK&K Team will proceed with the development of construction plans and specifications. The plans and specifications will be prepared to support the various phases of the project. Upon completion, the plans will be combined with the bidding and contract documents necessary to advertise the project for bid. The plans will provide a detailed description of the work to be completed by the contractor. The plans will be supplemented by detailed specifications defining the method of completing the work and the material specifications. RK&K's detailed specifications have been refined over years of working within the State, incorporating the lessons learned from similar wastewater improvement projects.

During the development of the contract plans and specifications, the RK&K Team will meet frequently with DNR to review progress and receive input. Normally, plans for owner and regulatory agency review and comment are submitted at 60%, 90% and 100% completion status. Development of complete detailed plans and specifications substantiates completion of an effective project with minimal construction problems and change orders which often result in additional costs.

Preparation of Bidding and Contract Documents

With completion of the plans and specifications, we prepare contract and bidding documents in anticipation of advertising the project for bids. This complete package will be used to define the project requirements from a contractual perspective for uniformity of requirements among all contractors.

Assembly of the contract and bidding documents completes the project package. RK&K will prepare these documents as determined by DNR funding requirements.

Following preparation of the complete construction document package, updated permits will be obtained from the Department of Health, Department of Environmental Protection and other applicable entities before going to bid. All necessary rights-of-way or easements must be acquired. RK&K will prepare the permit applications for DNR's submittal. RK&K will provide any technical assistance required during the review process. RK&K is licensed to survey and prepared to assist DNR in securing easement(s) and right-of-way(s). Although these approvals are straightforward, they will take time.

Bidding Phase Assistance

With approval of DNR and other agencies, the project can proceed to bid advertisement. A contract of this scope of work is normally advertised for three to four weeks to allow sufficient time for contractors to assemble prices and prepare a competitive bid. During that time, the RK&K Team will conduct a pre-bid meeting with the contractors to review the project and answer any questions. An addendum will be issued as necessary to clarify any element of the project.

The project will be advertised for bids in accordance with State Law and Agency requirements. Projects are normally advertised in the local and regional newspapers. Advertisement in the Charleston or adjacent newspapers is also recommended to reach a wide audience of contractors. In addition to the newspapers, plans will be placed with Dodge Reports, West Virginia Contractors Association and other plan rooms in the West Virginia area. The objective is to alert as many contractors as possible and increase competition towards securing a low bid for the project.

At a specified date and time, bids will be collected at a designated location. RK&K will then assist DNR in reviewing the bids. The apparent low bidder will be announced at the end of the meeting.

PROJECT MANAGEMENT

Effective project management begins with creating the best team possible to accomplish the required work. We have assembled a comprehensive team experience in wastewater system design, operations and maintenance. As previously mentioned, John Cole will be the main point of contact and Project Manager leading our team. His proactive approach to establishing and maintaining open communication and cooperation among the team allows our team to quickly adjust to project changes and resolve issues without confusion or delay. As Project Manager, he will make sure that project tasks are progressing on schedule and on budget. He will also be responsible for ensuring that our team is performing the appropriate quality control checks.

Our exceptional project management process, team coordination, and early and continuous coordination with DNR's staff and regulatory agencies will lend to a successful project delivery. RK&K's project management tools include RK&K's in-house Project Management Guidelines that are a collection of best management practices proven to produce successful projects. Mr. Cole will utilize the guidelines and software tools to manage this project including Microsoft Project for planning and scheduling tasks, resources, and deliverables. RK&K's project cost reporting software will be used to track project labor and other direct costs. Project charges will be updated on a weekly basis providing Mr. Cole with the latest cost information for each of the projects they are managing.

RK&K's management approach is based on providing the following commitments to clients:

- Meeting established schedules and exceeding expectations by responding rapidly to client requests;
- Manage multiple assignments simultaneously, if required;
- Uphold quality of service through implementation of our in-house Quality Assurance and Quality Control (QA/QC) Program; and
- Dedicate the appropriate resources and experienced staff to meet accelerated schedules.

Work on this project will begin with a project initiation meeting to establish a clear project understanding and to determine the lines of communication between Mr. Cole, RK&K's Project Manager, and DNR's representatives. All project goals and requirements will be identified via an Internal Project Memorandum. After developing a clear understanding of the project requirements, Mr. Cole will draft the technical approach, anticipated schedule and staffing requirements, and fee estimate. These documents will be reviewed in draft format with the DNR's project manager. Once the draft scope of work and schedule, are approved, he will submit final documents for approval by DNR. Once DNR issues a Notice to Proceed, he will develop a Work Plan that documents the scope, budget, and schedule; identifies the standards that will be followed; identifies critical project elements; and establishes coordination requirements.

QUALITY ASSURANCE



Quality is paramount at RK&K. RK&K's Quality Assurance / Quality Control (QA/QC) Program will be a crucial component to maintaining the established schedule and budget for this project. RK&K employs a continuous, multi-faceted QA/QC approach. RK&K places great emphasis on developing the highest quality engineering and environmental products. It is RK&K's belief that future assignments are obtained in large measure on how well current assignments are performed. RK&K utilizes standardized policies for maintaining quality in the work produced.

Through the rigorous application of appropriate criteria and sound engineering practice, QC for each assignment will be performed by every employee working on the project. Team members will utilize RK&K's established QA/QC Program, which includes three major principles: **project management control, quality of work and cost control.**

Quality Assurance and Quality Control is a top priority in the development of any RK&K project.

Quality of Work

Coordinating with team members assures proper direction and flow of information. The successful implementation of such a course of action requires daily contact between the Project Manager and key staff members. RK&K will implement an established in-house Staff Operating Plan (SOP) which has proven successful in the past. QA/QC at RK&K is an active and iterative process beginning at project inception, concluding only after the project goals and objectives have been met.

To comply with this approach, QA/QC will be addressed at various levels, as described in the previous section, with QC at the discipline lead level and QA at the discipline Project Manager/peer review level. No deliverable will be submitted to DNR without fully complying with our QA/QC process.

Execution of tasks assigned under this contract is an extension of RK&K's QA/QC procedures and requires an effort by all involved personnel in producing quality documents (studies, reports, plans, specifications, etc.) that: are complete, accurate and concise; provide sufficient detail and description; are consistent with established codes, design criteria and West Virginia and federal standards; provide a completed product that is constructible, operable and maintainable; and completely satisfies the needs of the DNR.

Cost Control

RK&K maintains a cost accounting system (DELTEK system) that is capable of segregating and identifying accumulating costs for each job performed under Cost-Type projects. The Project Manager will carefully monitor budgets on a weekly basis. RK&K's DELTEK system allows managerial staff to monitor progress versus budget, which aids in the identification of potential problem areas and allows the implementation of appropriate remedial actions early enough in the project to make sure that tasks are completed within budget. RK&K's system provides the project management team with a report that includes a breakdown of man-hours and payroll by individual tasks for "budget", "actual payroll used", "available to complete" and the budgeted and actual hourly payroll rates which enables the project manager to monitor the project status quickly and efficiently.

RK&K's cost accounting system is an asset for monitoring project progress versus budget.

PROJECT TEAM

RK&K provides planning, design and construction phase services daily for wastewater system projects throughout the mid-Atlantic and Southeastern regions. Team members chosen for this project have extensive histories working on successful wastewater improvement projects. The following paragraphs provide information on key staff members chosen for this project.



As Project Manager, John W. Cole, PE will oversee the administrative and technical aspects of the project and make sure consensus is reached at each phase and that the design solutions we develop are responsive to DNR's goals and needs. He offers his 17 years of diverse experience in the field of wastewater system design to this project where he has been the lead engineer and managed numerous wastewater improvement projects. He will remain in contact with DNR for the project's duration ensuring the progress of the work and verifying DNR's needs are met.



Michael W. Myers, PE, Partner, has more than 33 years of municipal engineering experience and will serve as Partner-in-Charge. Mr. Myers is responsible for RK&K's water/wastewater practice firm-wide and will ensure adequate resources are made available to the project team to successfully deliver all required services. He is experienced in all aspects of sanitary/environmental engineering including planning, design, permitting, construction, operation and maintenance and troubleshooting for water and wastewater pipelines, pumping stations and treatment facilities throughout West Virginia and the mid-Atlantic and Southeastern Regions.

Mr. Myers will ensure that RK&K's standards of quality and performance are maintained and that DNR is satisfied with the level of service we are providing. He will also assist with the management of contract negotiations. He places the full weight and integrity of the RK&K leadership behind our Project Manager, John Cole, PE, and has dedicated the individuals shown on the organizational chart to make sure our contract commitment is met. The RK&K Team is organized to offer Mr. Cole as a continuous, single point of responsibility to DNR for the duration of this project.

RK&K's Team Members –bring a unique mix of skills, experience and portfolio of working together on dozens of wastewater infrastructure projects. This collective depth and breadth of our personnel's experience makes our team perfectly suited to promptly deliver all aspects of work required for these improvements. They will assist the key leaders listed above on this project. Each have been chosen for their ability and experience on past relevant projects, as well as availability to perform the work. This team has provided a multitude of planning, design and construction phase services for wastewater improvement projects throughout West Virginia.

RK&K's team is comprised of highly-qualified individuals with vast knowledge and experience in their respective fields. They will assist the Mr. Cole in the successful delivery of this project. Each were selected due to their ability and experience on past relevant projects, as well as availability to perform the work. This team has provided a multitude of planning, design and construction phase services for wastewater system projects throughout state.



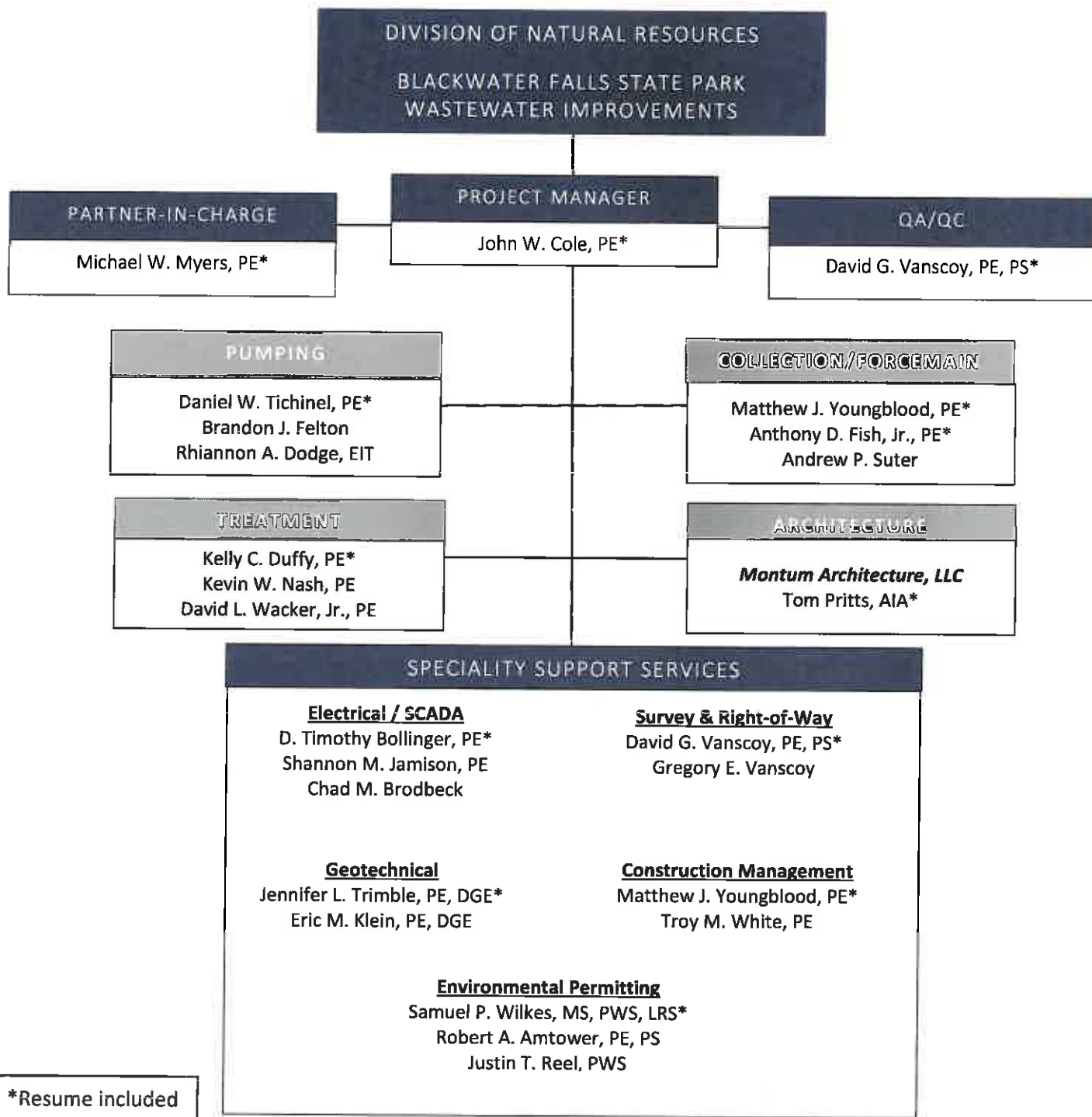
Subconsultant – RK&K will utilize the services of **Montum Architecture, LLC** to assist in Architecture services, if required. **Thomas F. Pritts, AIA** will lead Montum team offering his more than 17 years of experience in design, specifications, and project management gained on a wide range of projects, including several current and past projects for the DNR. Mr. Pritts is a member of the West Virginia Chapter of American Institute of Architects and was involved in the establishment of the US Green Building Council's West Virginia Chapter. RK&K will oversee all work provided by Montum.

Team Organization

As illustrated in our organization chart on the following page, we have assembled our team to be responsive to each item within the scope of work involved with this project. As such, our team is equipped to work concurrently to deliver high-quality projects, on-time, and within budget. Each team member has more than sufficient staff capacity to devote to their areas of discipline.

Resumes of each key team member are also provided.

ORGANIZATIONAL CHART



JOHN W. COLE, PE PROJECT MANAGER



Education: BS, Civil Engineering Technology, Fairmont State College, 2001

Professional Registration: Professional Engineer, WV, 2008 [REDACTED]; also registered in MD, VA & OH

Experience: 17 years

Mr. Cole has been actively involved in the planning, design, and construction of West Virginia's infrastructure projects for more than 17 years, providing industry leadership through addressing the region's infrastructure needs. He has diverse experience in design of water and wastewater treatment plants, pumping stations, distribution and collection systems, subdivision development, and construction management. His responsibilities include full project delivery including feasibility studies, design, construction plans and specifications, cost estimating, construction administration inspection and engineering.

Town of Oakland Sewer Improvements, Oakland, MD: Project

Manager. Responsible for the design of various sewer line replacements, I&I flow monitoring and smoke testing, and the installation of a bar screen at the Town's main pump station, upstream of the wastewater treatment plant. Project also included the preparation of both a Preliminary Engineering Report (PER) and Environmental Report (ER) for submission to USDA Rural Utility Service (RUS) for funding.

New Creek Public Service District, Mineral County, WV: Project Manager. Oversaw flow monitoring and smoke testing efforts for locating sources of inflow and infiltration entering the collection system.

Carolina and Idamay Sewer System Replacement Project, Greater Marion Public Service District, WV: Project Engineer responsible for inflow and infiltration study; preparation of conceptual design to replace a failing vacuum collection system; overseeing design of approximately 25,200 LF of gravity sewer, 9,500 LF of pressure sewer, 7,400 LF of force main, and two sewage pump stations.

Northern Mineral County Regional Sewer System Wastewater System, Mineral County Commission, WV: Project Engineer responsible for assisting in the development of the facilities plan recommending a regional sewer project consisting of a new 1.2 mgd WWTP, 40 miles of sewer collection, 2.5 miles of sewer rehabilitation, three miles of sewer force mains, and 10 sewage pump stations; coordinated efforts involved in the funding and permitting process. Phase 1- Design: responsible for coordinating and overseeing the design of the WWTP including the following major components, influent pump station, mechanical fine screen, vortex grit unit, Aqua SBR's, post-equalization, automatic backwashing filters, aerobic digesters, and a belt filter press.

Charles Town Utility Board On-Call Water & Sewer Projects, Charles Town, WV: Project Manager. Oversaw design and construction phase services for various water and sewer on-call projects. Projects included design and construction of new sewage lift stations; modifications to existing sewage lift stations; over 10 miles of water mains and sewage force mains; improvements to two of the Utility's three WWTP's; improvements to the single WTP including a 1 MG water storage tank; construction of three emergency back-up generators; painting of several elevated water storage tanks.

Tuscowilla WWTP, Charles Town, WV: Project Manager responsible for coordinating RK&K's evaluations for optimizing the start-up of a new Four Stage Bardenpho membrane bioreactor facility designed for BNR treatment. Oversaw the design and construction of the effluent pump station and 5,600 LF of 8" force main including the telemetry system for operating the pumps.



West Virginia State Board of Registration for Professional Engineers

**JOHN W. COLE
WV PE [REDACTED]**

This is to certify that the above named PROFESSIONAL ENGINEER has met the requirements of the law, is duly registered and is entitled to practice engineering in the State of West Virginia.

EXPIRES December 31, 2020

MICHAEL W. MYERS, PE PARTNER-IN-CHARGE



Education: BS, Civil Engineering, Pennsylvania State University, 1985
MA, Management, Webster University, 1989

Professional Registration: Professional Engineer, WV, 2009 [REDACTED]; also registered in MD, PA, VA, FL, NC, TX, DE, & DC

Experience: 33 years

Mr. Myers is responsible for RK&K's municipal water/wastewater engineering and utility design practice firmwide, and will ensure adequate resources are made available. He has extensive experience with water, wastewater and stormwater infrastructure improvement projects, and has served as a project manager and designer on many technically diverse planning, study and design projects throughout the mid-Atlantic region and Southeastern Regions.

Northern Mineral County Regional Sewer System Mineral County, WV: Partner-in-Charge. Responsible for this \$39 million regional sewer system project which includes over 40 miles of sewer collection; 10 pump stations and a new 1.20 MGD wastewater treatment plant including biological nutrient removal.

New Creek Public Service District, I&I Evaluation, Mineral County, WV: Partner-in-Charge of project for flow monitoring and smoke testing to locate sources of inflow and infiltration entering the collection system.

Charles Town Utility Board On-Call Water & Sewer Projects, Charles Town, WV: Partner-in-Charge. Overseeing design and construction of various water and sewer on-call projects. Projects ranged from the design of new sewage lift stations, modifications to an existing sewage lift station, design of over 20,000 LF of sewage force mains, to overseeing painting of two elevated water storage tanks and water treatment plant.

DB Water & Sewer Deficiencies Correction, Martinsburg, WV: Partner-in-Charge. As a consultant RK&K assisted on major improvements to the water and sewer system at the VA Medical Center in Martinsburg, WV. Scope of work involved new and replacement water and sewer lines, removal and reclamation of existing abandoned water and sewer infrastructure and rehabilitation and replacement of existing sewer collection system.

Frankfort Public Service District Water System, Wiley Ford, WV: Partner-in-Charge of Water system evaluation, upgrades/improvements, and extension projects for the FPSD's water system to include preparation of a preliminary engineering study and report which will be used for funding applications; system evaluation; preliminary and final design services; preparation of all necessary permit applications; preparation of construction plans, specifications, and bidding documents; assistance during bidding; and construction administration and inspection services.

On-Call Water System Improvements, Berkeley County, WV: Partner-in-Charge of a water audit project with the primary goal of identifying the causes of excessively high-water losses in the County's Northern Service Area. Tasks performed under this audit included leak surveys, testing and calibration of larger master meters, district metered area (DMA) testing, large billing meter profiling and sizing and consumption analysis.



West Virginia State Board of Registration for Professional Engineers

**MICHAEL W. MYERS
WV PE [REDACTED]**

This is to certify that the above named PROFESSIONAL ENGINEER has met the requirements of the law, is duly registered and is entitled to practice engineering in the State of West Virginia.

EXPIRES December 31, 2020

DAVID G. VANSCOY, PE, PS

QUALITY ASSURANCE AND QUALITY CONTROL/SURVEY & RIGHT-OF-WAY



Education: MS, Structural Engineering, West Virginia University, 1972

BS, Civil Engineering, West Virginia Institute of Technology, 1970

Professional Registration: Professional Engineer, WV, 1974 [REDACTED] also registered in MD

Professional Surveyor, WV, 1995 [REDACTED]

Experience: 46 years

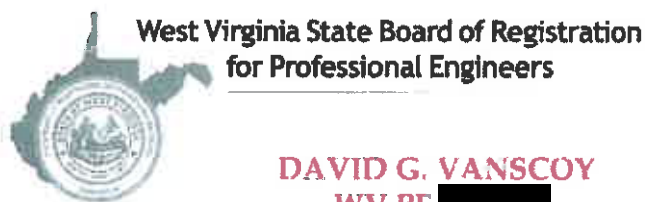
Mr. Vanscoy has more than 46 years of experience in design and management of diverse civil engineering projects including streets/roadways, water distribution and treatment facilities, wastewater collection and treatment facilities, and site development. Mr. Vanscoy is very skilled in working with multidisciplinary teams on large, complex projects to ensure seamless interfaces between disciplines, as well as interfacing with local interests involved in smaller projects in ensuring that their needs are met.

Carolina and Idamay Sewer System Replacement Project, Marion County, WV: Director in Charge. Performed a study evaluation of a relatively new vacuum collection system for Communities of Idamay and Carolina which suffered from inability to function properly. The study resulted in design and construction engineering services for the elimination of failing vacuum collection system and construction of 6,300 LF of pressure sewer. Also performed Inflow and Infiltration Study as part of this project.

Northern Mineral County Regional Sewer System Phase 1 Wastewater Treatment Plant (Design and CM/CI), Mineral County, WV: Director in Charge. Responsible for a \$39 million regional sewer system project which included over 40 miles of sewer collection; 10 pump stations and a new 1.20 MGD wastewater treatment plant including biological nutrient removal.

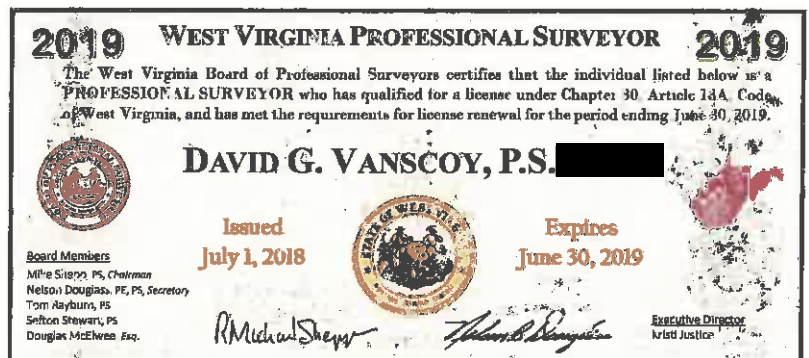
Frankfort Public Service District - Wiley Ford Sewer Project, Wiley Ford, WV: Director in Charge. Responsible for design, contract plans and specifications, construction engineering and inspection services, and obtaining funding for the new Wiley Ford Sewer System. The project provides wastewater collection services for over 450 resident and commercial customers. The collection system consists of over 55,000 feet of collection lines, 6,600 feet of force main, and nearly 12,000 feet of service laterals. The system contains 273 manholes and 48 cleanouts. Construction bids were 1.1 million below the engineer's estimate. Also included in the system were three duplex pumping stations and an 8" force main under the Potomac River to discharge into the City of Cumberland system.

Ridgeley Sewer System Evaluation, Mineral County, WV: Director in Charge. Evaluated the existing Ridgeley Sewer System and developed plans to correct the considerable problems with backups and clogged and failed lines. Following the study, prepared a facility plan which described the proposed \$1.96-million project. This facility plan was then used to prepare a funding application to the West Virginia Infrastructure and Jobs Development Council.



This is to certify that the above named PROFESSIONAL ENGINEER has met the requirements of the law, is duly registered and is entitled to practice engineering in the State of West Virginia.

EXPIRES December 31, 2020



MATTHEW J. YOUNGBLOOD, PE

COLLECTION/FORCEMAIN & CONSTRUCTION MANAGEMENT



Education: BS, Civil Engineering, West Virginia University, 2006

Professional Registration: Professional Engineer, WV, 2016 [REDACTED]

Experience: 12 years

Mr. Youngblood has 12 years of experience with a background in municipal wastewater/water treatment design and collection system infrastructure. His skills include facilities planning, preliminary study and design of water and wastewater facilities, water distribution network and sewer network, and construction management services.

Carolina and Idamay Sewer System Replacement Project, Greater Marion Public Service District, Marion County, WV:

Project Engineer. Assisted with Inflow and Infiltration study with sewer camera inspections. Designer on vacuum sewer line relocation to improve the efficiency of the sewer collection system in the Town of Idamay. Also assisted with design to replace the vacuum system with gravity and force main sewer system. Construction Engineer on replacement of the vacuum system.

Oakland Water Distribution System Study, Town of Oakland, MD: Project Engineer. Responsible for the design of waterline replacements on numerous streets in Oakland, which included the design of booster stations to provide adequate pressure to water customers within the system.

Water Line Extension, Town of Lonaconing, Allegany County, MD: Designer. Assisted on four water improvement projects including new lines and line replacement and construction management in the Towns of Midland, Barton and Lonaconing.

Water System Improvements, Town of Lonaconing, Allegany County, MD: Construction Engineer. Assisted in the replacement of Koontz Run Dam. Existing earth dam was replaced with three-million-gallon pre-fabricated concrete tank.

Northern Mineral County Regional Sewer System Phase 1 Collection System, WWTP (CM/CI), Mineral County, WV: Construction Engineer. Aided with this new regional sewer collection system which includes over 20 miles of sewer collection lines. Provided engineering oversight of 0.6 mgd Wastewater Treatment Plant to serve Northern Mineral County.

Northern Mineral County Regional Sewer System Phase 2 Collection System, Mineral County, WV: Construction Engineer. New gravity collection and force main sewage system to replace individual septic systems and old collection system which was in non-compliance with state regulations. The project included a river crossing and installation of three duplex pump stations with auto-dial alarm systems. Both portable and permanent generators were provided as part of the project.

Romney Collection System Replacement, Phase 1, Hampshire County, WV: Assisted in the construction management of the sewer collection system replacement project.

Tuscan Ridge Subdivision Site Development, Atlantic Land Corporation, Davis, WV: Assisted with design of roadway layout, which included sizing culverts for drainage in the subdivision. Also assisted with the design and layout of the water and sewer utilities.

Deep Creek Lake State Park, Garrett County MD: Project Designer on the replacement of water line and two chlorination feed stations. Designed an RV dump station to expand the traffic volume for the camp ground.



**West Virginia State Board of Registration
for Professional Engineers**

**MATTHEW JOSEPH YOUNGBLOOD
WV PE [REDACTED]**

This is to certify that the above named **PROFESSIONAL ENGINEER** has met the requirements of the law, is duly registered and is entitled to practice engineering in the State of West Virginia.

EXPIRES December 31, 2020

ANTHONY D. FISH, JR., PE COLLECTION/FORCEMAIN



Education: BS, Civil Engineering, West Virginia Institute of Technology, 1992
AS, Drafting & Design Engineering Technology, WV Institute of Technology, 1987

Professional Registration: Professional Engineer, WV, 2004 [REDACTED]; also registered in MD

Experience: 25 years

Mr. Fish recently joined RK&K as Senior Project Engineer in RK&K's newly opened Charleston, WV office. Mr. Fish brings 25 years of experience as a civil engineer, including experience on projects in West Virginia, with strong design and project management skills. Qualified in all phases of project development, his experience includes problem identification, conceptual solutions, cost estimating, preliminary and final design, plan production, contract development, work selection, contract administration, construction inspection and field engineering. Before joining RK&K, Mr. Fish was the Assistant City Engineer for the City of Charleston, West Virginia (2003-2016) where he managed small, medium and large design and construction projects.



West Virginia State Board of Registration for Professional Engineers

ANTHONY D. FISH
WV PE [REDACTED]

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EXPIRES December 31, 2020

Court Street Pump Station Rehabilitation, Charleston, WV: Project Manager and Design Engineer. Over the last major, \$495K rehabilitation and retrofit of the Court Street Pump Station. Oversaw the design and construction of a major pump station rehabilitation and upgrade. Upon successful separation of the storm and sanitary flows in the Court Street area, the 1970's era technology facility was replaced with modern lifting pumps, an updated control and automation system, and a separated redundant external pump which starts and operates on natural gas in the event of a main system shutdown or power failure.

Garrison Avenue / Magazine Branch Storm Sewer Rehabilitation, Charleston, WV: Lead Designer. Oversaw construction of a major rehabilitation to the Garrison Avenue storm sewer. The main line, consisting of twin structures 96" to 60" in diameter and 10,600 LF was rehabilitated fully at several joints and a new pipe invert was placed using shotcrete and pumped epoxy. Several laterals were replaced, and access / manholes were rehabilitated and replaced at seven locations.

Virginia Street Pump Station Rehabilitation, Charleston, WV: Project Manager. Responsible for the replacement of a failing lift station pump located at the Railroad underpass on Virginia Street West. A lift station serving a narrow urban railroad underpass failed during a particularly wet West Virginia Spring causing localized flooding and resulting in full roadway closure. Designed and implemented an emergency pump replacement and control and power system rehabilitation to quickly return the lift station and the roadway to service.

Twilight Drive Storm Sewer Rehabilitation, Charleston, WV: Assistant City Engineer. Planned and reconstructed a large, failed concrete box channel transporting water from the Twilight Drive incinerator, under Barlow Drive and to the Elk River. The project involved reconstruction of large collapsed segments of the conduit, rehabilitation of joints and the placement of approximately 725 feet of new invert.

Assistant City Engineer, City of Charleston, WV: Assistant City Engineer. Worked in a variety of disciplines including structural, architectural, transportation and geotechnical engineering design and mapping and GIS development. Management of small, medium and large design and construction projects.

DANIEL W. TICHINEL, PE PUMPING



Education: BS, Civil Engineering, Bucknell University, 2010

Professional Registration: Professional Engineer, WV, 2015 [REDACTED]; also registered in MD

Experience: 8 years

Mr. Tichinel has eight years of civil engineering experience with an emphasis on water and wastewater infrastructure. His experience includes preparation of preliminary engineering reports (PER) and environmental reports (ER), the design of water distribution systems and sanitary sewer systems, including pump stations and collection and conveyance system evaluation, pump station rehabilitation design, new pump station design, pressure reducing stations, water treatment plant design, storage tank design, and pipeline replacement/realignment projects.

Garrett County Department of Public Works – Deep Creek WWTP Preliminary Engineering Report / Environmental

Reports: Project Engineer. Responsible for preparation of a PER & ER for the 2.2 MGD Deep Creek Lake WWTP Enhanced Nutrient Removal upgrade.

Garrett County Department of Public Works – Trout Run WWTP Preliminary Engineering Report / Environmental Reports: Project Engineer. Responsible for preparation of a PER & ER for the 0.9 MGD Trout Run WWTP Enhanced Nutrient Removal upgrade.

Berkeley County Public Service Water District – Phase B Distribution System Improvements, Berkeley County, WV: Project Engineer. Responsible for design of 1,830 LF of 12" CL 51 DIP water line and 2,390 LF of 16" CL 51 DIP water line within residential areas of the County to improve the overall hydraulics of the water system.

Puzzley Run Water Treatment Plant, Grantsville, MD: Project Engineer. Responsible for design of a 100,000 gpd water treatment plant. The design included the treatment facilities, site layout and associated mechanical equipment. The project achieved the client's desired treatment capacity while minimizing the site's disturbance area.

Town of Luke – Preliminary Engineering Report, Luke, MD: Project Engineer. for preparing a PER to examine the feasibility and probable costs for various water distribution and water supply alternatives to improve the Town's water supply and service. Preparation of the report involved evaluating three different water distribution alternatives and six different water source options for the Town.

Frankfort Public Service District, Water System Upgrade, Contract 3 – Water Treatment Plant Improvements, Fort Ashby, WV: Project Engineer. Responsible for design of numerous improvements including water filter and valve upgrades; sediment basin upgrades and maintenance; raw water and grinder pump upgrades maintenance; dewatering pump station upgrades; 1500 sf storage facility, intake maintenance, plant painting.

Frankfort Public Service District, Water System Improvements, Contract 4- Waterline Construction & Pump Station: Project Engineer. Responsible for the design of a new 150-gpm pump station along Painter Hollow Road. The project alleviated low pressure problems within the Sunrise Heights and Deerfield Estates subdivisions and eliminated the need for two booster stations and two deteriorated water storage tanks.



**West Virginia State Board of Registration
 for Professional Engineers**

**DANIEL WAYNE TICHINEL
 WV PE [REDACTED]**

This is to certify that the above named PROFESSIONAL ENGINEER has met the requirements of the law, is duly registered and is entitled to practice engineering in the State of West Virginia.

EXPIRES December 31, 2020

KELLY C. DUFFY, PE
 TREATMENT

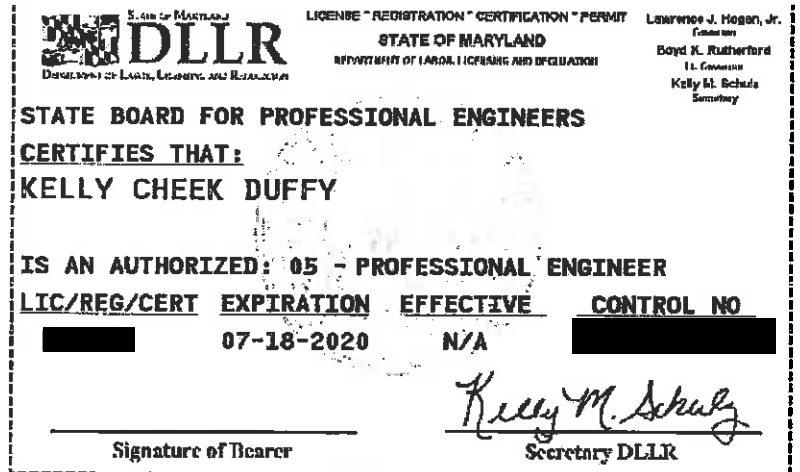


Education: MS, Environmental Engineering, University of Massachusetts, 1998
 BS, Agricultural and Biological Engineering, Cornell University, 1996

Professional Registration: Professional Engineer, MD, 2002 [REDACTED]

Experience: 21 years

Ms. Duffy is a Senior Manager for RK&K’s Wastewater Sector and has 21 years of wastewater collection and treatment engineering experience. Her experience encompasses project phase from planning, design, and construction administration services. She has been involved with wastewater treatment plant and collection system projects through various project phases. She has completed several wastewater treatment plant designs, most of which were designed for nutrient removal. Many of the projects she has completed were small to medium sized facilities with a focus on providing a cost effective, reliable facility with maintenance requirements consistent with staffing. She has worked on all project phases including Preliminary Engineering Reports, final design and construction phase services.



Northern Mineral County Regional Sewer System Phase 1 WWTP, New Mineral County, WV: Project Engineer. Responsible for preliminary design and equipment selection for a new 0.6-MGD WWTP designed for BNR treatment. The preliminary design included an evaluation of treatment technologies, including SBR, oxidation ditch and wave oxidation systems. The SBR treatment system was selected, and a subsequent evaluation of SBR vendor systems was performed. Denitrification filters were provided. All plant processes were designed including headworks, chemical feed, disinfection, aerobic digestion and sludge dewatering using a belt filter press and liquid polymer feed system.

City of Charles Town On-Call Water & Sewer General Services, Jefferson County, WV: Project Engineer for on-call engineering services contract for water and sewer related projects. Responsible for an evaluation of operational improvements at the Tuscawilla WWTP, including modifications to the MBR facility. Also, responsible for an evaluation of upgrades to the Charles Town WWTP.

Frankfort Public Service District - Wiley Ford Sewer Project, Wiley Ford, WV: Project Engineer. Assisted in a Facility Plan evaluation of 0.5 and 1.0 MGD BNR treatment facilities for a new WWTP. The Facility Plan included an evaluation of using three technologies for BNR treatment: oxidation ditches, Biolac - type wave oxidation treatment, and SBR treatment. The WWTP evaluation also included unit processes for screening, grit removal, clarification, chlorination, dechlorination, sludge thickening, and sludge dewatering with a belt filter press.

Wastewater Treatment Plant -- Central Hampshire Public Service District, Hampshire County, WV: Project Engineer responsible for upgrade of treatment plant using the wave oxidation treatment system. The upgrade included replacing and adding treatment basin aeration equipment, providing aeration of a sludge storage basin to prevent freezing, providing new blowers, and the addition of a new forty-foot diameter clarifier. Upgrades improve treatment and allows incoming flows to increase to the original plant design capacity of 0.2 MGD.

D. TIMOTHY BOLLINGER, PE
 ELECTRICAL/SCADA

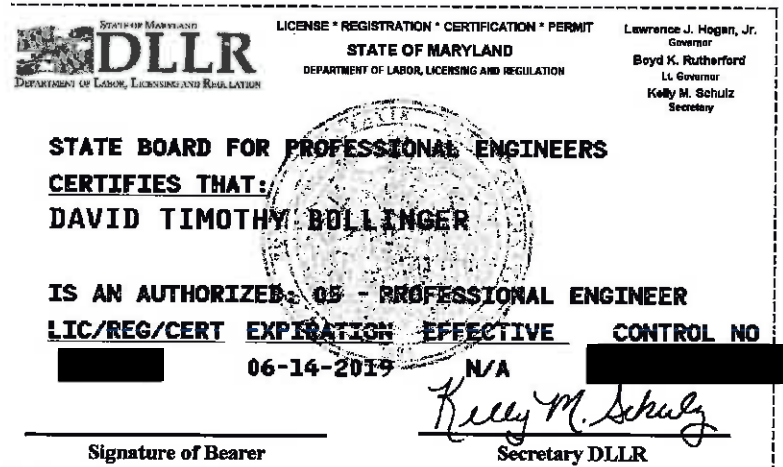


Education: BS, Civil Engineering, Bucknell University, 1977

Professional Registration: Professional Engineer: PA, 1984 [REDACTED] also registered in MD, NC, & VA

Experience: 41 years

Mr. Bollinger's 41-year career involves the study and design of electrical and instrumentation/control systems for a variety of water and wastewater treatment and pumping facilities. He performed instrumentation and process control design for systems including programmable controllers, remote monitoring and control systems and personal computer operation. He provides electrical engineering support for RK&K's utility, energy and environmental projects, including electrical design inclusive of instrumentation and control and SCADA interfacing services. As part of the design process, he prepares detailed P&ID drawings and a description of operation.



Northern Mineral County Regional Sewer System Phase 1 WWTP, New Mineral County, WV: Electrical/I&C Engineer. Provided the electrical design for the WWTP, which included a main distribution switchboard with automatic transfer switch, diesel emergency generator, power distribution, underground duct banks, lighting design and an electrical grounding system. Designed a Process Control System for the WWTP consisting of motor control centers, variable frequency drives, control panels, instrumentation, a PLC System, and HMI software. The PLC System consisted of three Allen-Bradley CompactLogix PLCs, and three operator interface touch screens. The HMI software utilized for the project was Rockwell Software View SE. The project included a new horizontal open-channel UV system.

Elk Neck State Park Wastewater Treatment Plant Phase I Upgrade, Cecil County, MD: Electrical/I&C Engineer. Assisted on the design-build project for an interim upgrade to an existing extended aeration activated sludge plant. The interim upgrade includes new influent pumping, flow equalization, aeration, and ultraviolet radiation disinfection.

On-Call Water & Sewer General Services, City of Charles Town, Jefferson County, WV: Electrical/I&C Engineer. On-call engineering services for water and sewer related projects for the Charles Town Utility Board (CTUB).

Patapsco Wastewater Treatment Plant ENR Facilities, Baltimore, MD: Electrical/I&C Engineer. Final Design services for the 90-mgd ENR facilities at Patapsco WWTP. ENR facilities designed to treat the effluent from the existing secondary treatment system.

Coliseum Drive Pressure Reducing Station and Offline Storage Facility, Hampton Roads Sanitation District, City of Hampton, VA: Electrical/I&C Engineer. Proposed in-line pressure reducing sewage pumping station to relieve discharge pressures for multiple sewage pumping stations in the City of Hampton. Facility will feature in-line quad-plex pumping, duplex tank drain pumps, automated controls, variable frequency drives, automated control and isolation valves and standby power generator. Services included facility siting, wetlands delineation, permitting and mitigation, geotechnical investigations, design bid and construction phase services.

Vint Hill Wastewater Treatment Plant Upgrade, Town of Warrenton, VA: Electrical/I&C Engineer Upgrade and expansion of an existing trickling filter treatment plant. Plant improvements include new screen and grit removal, SBRs filtration, ultraviolet radiation disinfection, and sludge digestion and dewatering. The design capacity of the upgrade facility is 0.6 MGD. Recently completed Phase 2 PER for expanding the facility to 0.9 mgd.

JENNIFER L. TRIMBLE, PE, DGE GEOTECHNICAL



Education: MS, Civil Engineering, West Virginia University, 1999
 BS, Civil Engineering, West Virginia University, 1998

Professional Registration:

Professional Engineer, WV, 2015 [REDACTED]; also registered in MD, DE, VA, PA, & DC
 Diplomate of Geotechnical Engineering, 2016, National Designation [REDACTED]

Experience: 19 years

Ms. Trimble is responsible for planning and directing geotechnical explorations, preparation of geotechnical engineering reports, geotechnical analyses, conducting technical reviews, developing plans/specifications, and providing QA/QC in support of highways, rail transit lines, buildings, water and wastewater facilities and other civil engineering projects. Technical experience includes evaluation of subsurface conditions, in-situ testing, conducting seismic refraction studies, verifying groundwater levels, evaluating risks in potential sinkhole areas, and providing recommendations with respect to geotechnical engineering considerations.



Northern Mineral County Regional Sewer System Phase 1

Wastewater Treatment Plant (Design), Mineral County, WV: Geotechnical Engineer. Assisted in the design of a new 0.6-MGD WWTP. Design included reinforced concrete SBR's, filtration facilities, influent pumping station, UV disinfection, chemical feed systems, sludge digestion and sludge dewatering. Design included reinforced concrete retaining walls and foundations for precast concrete facilities buildings.

Swan Point Wastewater Pumping and Water Reclamation Facilities, Charles County, MD: Geotechnical Engineer. Project included the construction of a new wastewater treatment facility, 0.3-million gallons per day, pumping stations, oxidation ditch, clarifier, UV radiation structure, filter structure, and influent and effluent force mains, provided Geotechnical Engineering Services. Foundations for the new eight structures consisted of approximately 900 tapered driven timber piles with an allowable capacity of 30-kips. Conducted one static pile load test and three Pile Dynamic Tests (PDA) on production piles.

Back River Wastewater Treatment Plant Digester Renovations (SC 8526), Baltimore, MD: Geotechnical Engineer. Project included the study, design and construction phase services to upgrade from the conventional high rate (CHR) digester process to the two-phase (acid-gas) anaerobic digestion process (two-phase process) with additional thickening facilities Phosphorus removal was achieved primarily through multi-point chemical addition at the primary and secondary clarifiers.

On-Call Sanitary Engineering Services, Baltimore, MD: Geotechnical Engineer. Provided geotechnical engineering recommendations and provided construction phase services for 72 MGD pump station that extended 50 feet below grade. Interceptor consisted of 15,600 feet of 54-inch force main, including 1,900-foot pile supported force main across the Back River, 430 feet of 90-inch diameter tunnel under AMTRAK and MD 150, support of excavation, and deformation monitoring of nearby structures. Provided and reviewed pile driving criteria and other construction phase services such as review of contractor submittals for monitoring adjacent structures during construction.

Stony Run Wastewater Diversion Pumping Station and Force Main, Baltimore City, MD: Geotechnical Engineer. Prepared Geotechnical Engineering Report and prepared Contract Documents for construction of a 26-mgd pump station and two stage construction MSE walls. Provided geotechnical recommendations for approximately 75-ft deep rock excavation adjacent to a historic bridge supported by shallow foundations and piles and 100-year old arched culvert.

SAMUEL P. WILKES, MS, PWS, LRS ENVIRONMENTAL PERMITTING



Education: MS, Environmental Science & Policy, Johns Hopkins University, 2003
BS, Earth & Environmental Science, Wilkes University, 1996

Professional Registration: Professional Wetlands Scientist, 2003 [REDACTED]

Experience: 22 years

Mr. Wilkes has more than 22 years of consulting experience as a project manager and senior environmental scientist providing technical support to watershed management, restoration, natural resource conservation, and hazardous materials programs. Experienced at providing oversight and managing field teams and contractors collecting wetland, stream quality, environmental media data, and general site condition data for site characterization.

Kanawha Valley Regional Transportation Authority Charleston, WV: Project Engineer. Investigated and closed out the WVDEP case files for a leaking underground storage tank through the UECA program. Provided staff oversight and quality control to employees and subcontractors conducting the field investigation, data validation and risk assessment.

Wyoming County Economic Development Authority, WV: Project Engineer. Former Lusk Lumber Treatment Plant Brownfield Site (WVVRP#16005), under the supervision of a Licensed Remediation Specialists, provided review and summary of previous investigations, composed sampling and analysis plan to address data gaps in previous investigations, coordinated with WVDEP Brownfields Staff. Anticipating sampling and developing remediation plan.

AU Associates, Logan County, WV: Project Engineer. Performed a Phase I ESA on a property to be purchased and developed for senior housing. Discovered potential USTs in 1950s Sandborn Maps, which triggered a Phase II ESA with ground penetrating radar (GPR) survey. The GPR survey revealed anomalies, which led to geoprobe subsurface sampling. Numerous soil samples indicted presence of petroleum hydrocarbons. Advised client against purchasing property and to turn over documents to the County and WVDEP as an abandoned UST Case. Client redesigned the building footprint from single story to three-story. Advised client to conduct additional environmental sampling along property line to ensure that no contamination plume was moving toward the remainder of the property.

Aboveground Storage Tank (WV Senate Bills 373 and 423 Implementation), WV: Project Manager. Supported numerous clients by conducting time critical visual inspections of approximately 2,000 ASTs throughout the state. Six inspectors were in the field for two months while an office support staff was processing daily reports from the inspectors into inspection logs, photo logs, reviews and recommendations for each AST. The inspection documentation resulted in a "Fit for Service", "Not Fit for Service", or "Fit with Required Repairs" determination for each tank. In addition, completed Spill Prevention, Response Plans for submittal to the WVDEP.

West Virginia Source Water Protection Plans, WV: Project Manager. Assisted in the development of over 20 source water protection plans for community drinking water systems throughout the state of WV for WVDHHR Conducted meetings with public water systems, assessed potential threats to the source water, suggested preventative and mitigation strategies and developed source water protection plans.

Utah Voluntary Cleanup Program Support, Park City, UT: Project Engineer. Worked collaboratively with UTDEQ Voluntary Clean-up Program staff and EPA to ensure consistency between Superfund and VCP sites. Provided recommendations on other consultants Field Sampling Plans, Quality Assurance Project Plans, Site Characterization Reports, and Remedial Action Plans.

Renewal



West Virginia
Department of
Environmental Protection

WILKES, SAMUEL PETER
Licensed Remediation Specialist
Registration Number [REDACTED]

[Signature]
Director, Division of Land Reclamation

DATE SIGNED - 05/05/2015
DATE EXPIRES - DATE EXPIRES

THOMAS PRITTS, AIA, LEED-AP, CSI-CCS ARCHITECTURE



Education: BA, Bachelor of Architecture, Virginia Tech, 2004

Professional Registration: Licensed Architect, WV, MD

Experience: 15 years

Mr. Pritts will serve as our team’s architect offering his more than 17 years of experience in architectural design, construction, and sustainable design practices. He is actively involved in all aspects of the project process, from the initial meeting to post-occupancy evaluation. Professional collaboration, innovative project delivery and an attention to detail are the qualities that define Mr. Pritts’. He is engaged at the professional, community and civic level and is a member of the West Virginia Chapter of American Institute of Architects and was involved in the establishment of the US Green Building Council’s West Virginia chapter.

WVDNR | Berkeley Springs State Park Pool Bathhouse Roofing Replacement: Architect for DNR project for specifications and administering roofing replacement of the pool bathhouse. The existing roofing was a combination of EPDM and built-up roofing. Failing wood framing was replaced and ACM abatement was incorporated in the demolition.

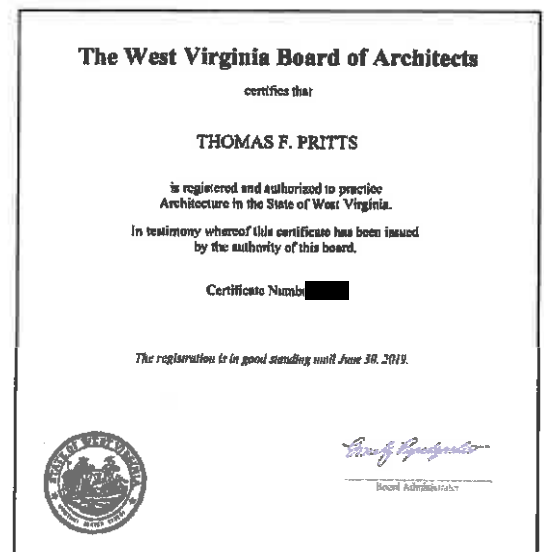
WVU Potomac State College Nursing Renovation: Architect for this project to renovate the former National Guard Armory to house the four-year WVU School of Nursing BSN program. The project converted former meeting spaces into demonstration nursing laboratories and lecture spaces. Office spaces were renovated. Electrical and HVAC systems were updated to meet the new needs.

Cacapon State Park – Old Inn Renovation: Performed work as a sub-consultant to the MEP designer who designed heating and air conditioning systems to convert the building for four-seasons use. Designed interior renovations and selected furnishings reconfiguring the space from its former use as individual lodging rooms into “whole-house” rentals for large gatherings like family reunions and corporate events. Updated the kitchen space with pro-style appliances and “large meal”-friendly layouts.

Wastewater Treatment Plant Upgrade, City of Martinsburg, WV: Performed work as a sub-consultant to the Process Engineer. The design centered around a moving bed biological reactor. Architectural work included rehabilitation of existing building for new functions, new process buildings, and a new operations office building. Integration with process piping and equipment design was critical and typically those needs defined the building configurations

Additional Project Highlights:

- Wyoming East High School HVAC Renovation – Wyoming County
- Mountainview and MTEC HVAC Renovation – Monongalia County Schools, WV
- Berkeley Springs State Park – Old Roman Bath Renovation
- Blackwater Falls State Park – Boiler Room Renovation
- Our Lady of the Mountains Parish – Bathroom Renovation



PREPARATION OF PER & ER FOR DEEP CREEK LAKE/TROUT RUN WASTEWATER TREATMENT PLANTS GARRETT COUNTY, MD

Owner: Board of County Commissioners of Garrett County, Maryland

Contact: Patrick Hudnall | 2008 Maryland Highway, Suite 2, Oakland, MD 21550 | 301.334.7465 | phudnall@garrettcountry.org

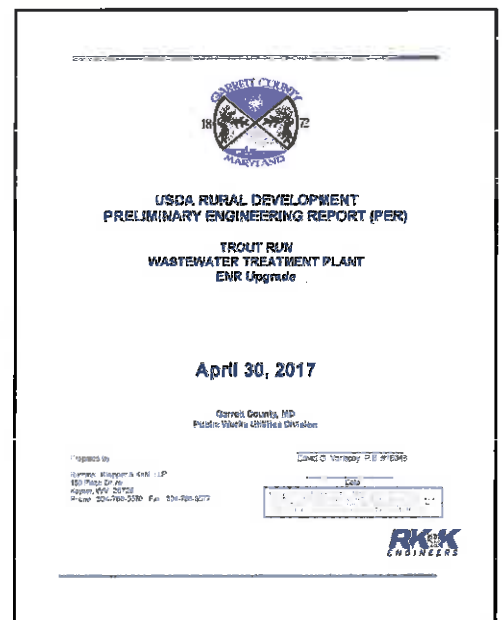
Dates: 2016 – 2017

Key Team Members: John Cole, Daniel Tichinel, Kelly Duffy, Kevin Nash

In 2016, the Garrett County Department of Public Works – Utilities Division retained RK&K's services to prepare Preliminary Engineering Reports (PER) & Environmental Reports (ER) to examine the feasibility and probable costs for an Enhanced Nutrient Removal (ENR) Upgrade to the Trout Run Waste Water Treatment Plant (WWTP) and Deep Creek Lake WWTP.

Deep Creek Lake WWTP: Preparation of the reports involved evaluating three process technologies for the ENR upgrade. The challenge presented to RK&K was to identify an ENR process that would perform to permit limits in the cool climate of Garrett County and would be acceptable to MDE. RK&K met the challenge by completing a thorough analysis of influent data and recommending a reconfiguration of the existing Orbal Oxidation Ditch. The report also included recommendations that would allow the WWTP to meet the current discharge permit. RK&K is currently assisting the Utilities Division with attaining funding from Maryland Department of Environment through the Bay Restoration Fund.

Trout Run WWTP: The scope of the reports included evaluating two alternatives for the proposed ENR upgrade. Each alternative included analyzing three biological process technologies to achieve the ENR goal. Alternative 1 involved evaluating upgrades to the existing Trout Run WWTP for ENR. Alternative 2 involved upgrading the existing Oakland WWTP for ENR to serve as a Regional WWTP for the Town of Oakland and Trout Run service areas. Alternative 2 also included an evaluation of five options to convey waste water from the existing Trout Run WWTP to the proposed Oakland Regional WWTP. Considering Trout Run WWTP and Oakland WWTP sit adjacent to the Little Youghiogheny River, identifying an economical and sustainable conveyance option that would meet current Maryland Department of Environment (MDE) wetland and waterways construction regulations was challenging. RK&K recommended a viable sewer force main conveyance option that has the lowest Life Cycle Costs and environmental impacts.



TOWN OF OAKLAND I&I STUDY

OAKLAND, MD

Client: Town of Oakland

Contact: Gwen Evans | 15 South Third Street, Oakland, MD 21550 | 301.334.2691 | townof oak@gmail.com

Dates: Ongoing

Key Team Members: Dave Vanscoy, John Cole, Andrew Suter, Rhiannon Dodge

The Town of Oakland retained RK&K as engineering consultant to perform a study of Inflow and Infiltration (I&I) entering into their sewer collection system. The Town has had high levels of water entering the sewer system during rain events, leading to overflowing manholes and overloading the treatment plant.

Oakland's sewer system dates to 1909, and some of the original pipe and manholes are still in operation today. Excess stormwater can enter the sewer system through old and vulnerable terra cotta pipes and brick-formed manholes. In addition, water can enter the system through illegally connected downspouts, improper pipe seals, and loose manhole covers. The Town has not been able to keep current with upgrades and remediation, and therefore, the cost to pump the excess stormwater has

and will continue to increase. Consequently, treatment cost will rise, causing an increase in sewer rates. The I&I Study will determine the causes of the excess water through three different aspects of investigation: manhole inspections, flow monitoring and smoke testing.

Manhole Inspections: This portion of the I&I study consisted of surface inspections at 436 manholes. Covers were removed, and photos were taken of the surface/environment around the cover for reference and of each pipe connection entering the manhole. Photos were also taken at any damaged or leaking locations. Multiple measurements, ranging from depth of manhole, diameter of all pipes entering and exiting the manhole and drop connection heights, were recorded. Inlet locations were referenced with respect to their position to the outlet pipe, and flow levels were noted at time of inspections. Weather and time of day were also noted. After all necessary items were recorded, each manhole was given a rating from 1 to 5, classifying each manhole's condition. 1 being good and 5 being poor.

Flow Monitoring: Portable flow meters were used to monitor and record flows during significant rain events at various manhole locations. The meters recorded level, velocity and temperature, but could produce a flow chart in gal/min for practicality. Flows were compared to rain and time to narrow down possible I&I sources on specific sewer lines. Later in the study, when televising the sewer lines would be conducted, a more specific area could be chosen based on flow monitoring results rather than televising the entire collection system, which reduced costs.

Smoke Testing: This portion of the study was conducted during dry periods, typically in the summer months to ensure that smoke could be detected above ground if it escaped the sewer lines. Testing was performed with a smoke blower, sewer pipe plugs, marker flags and a video camera to document any illegal connections, broken pipes, etc. Predetermined locations to place the blower were chosen ahead of time to test specific sections of sewer line efficiently. During the test, illegal downspout connections, broken/missing cleanout caps were the most common issue. The most frequent problem was illegally connected foundation drains and/or driveway drains. With video evidence, the Town was able to notify each property owner about the issues and required remediation, as well as address any problems that were the Town's responsibility.



GREATER MARION PUBLIC SERVICE DISTRICT I&I STUDY MARION COUNTY, WV

Client: Greater Marion Public Service District

Contact: Carol Brooks | 44 Aberdeen Drive, Worthington, WV 26591 | 304.287.2244 | mommaredsquirrel@msn.com

Dates: 2014

Key Team Members: Dave Vanscoy, John Cole, Matt Youngblood, Andrew Suter

In December 2013, the Greater Marion Public Service District (GMPSD) retained RK&K as its engineering consultant to perform an Inflow & Infiltration (I&I) Study of its sewer collection system, with a focus on the collection systems within the Communities of Carolina and Idamay, and to propose corrections to eliminate I&I where possible.

The communities of Carolina and Idamay originally had separate sewer systems. Each system consisted of a gravity design with terracotta pipe and brick manholes that conveyed sewage to the towns' individual WWTPs. Between 1998 and 2000 the GMPSD was formed and a new vacuum collection system was constructed in Carolina, Idamay, and adjacent Kellytown, and connected to Worthington's existing vacuum system. From the beginning, the new vacuum system had problems, with most of these being attributed to excessive I&I flows. The failing vacuum system was replaced in 2014 with a gravity system that conveys sewage to Worthington WWTP via force mains from two pump stations in each outlying community. The Community of Kellytown is still connected to the Worthington Vacuum Station via vacuum sewer.



Five study components were required to properly investigate the I&I problems found in both communities. The components are as follow: main line sewer video inspection, used to identify conditions of the main lines and any possible sources of I&I; smoke testing, conducted to locate illegal connections or possible breaks in the sewer lines; cleanout installation/lateral inspection, utilized at locations that warranted further investigation through video inspection of the properties lateral lines; individual house inspections, including in-house plumbing inspection, used when a lateral line showed evidence of I&I flow; flow monitoring, employed throughout study to monitor flow and progress toward I&I reduction.

This project featured two unique aspects: (1), study of a vacuum system that was converted back into a gravity system, with various aspects of the vacuum system still existing and allowing I&I flow; and (2), concurrent analyses of two communities' independent sewer systems with different types of I&I issues in each. One required over 70 cleanout installations with mainline issues in streams/springs while the other required less than 30 cleanout installations but had broken/damaged vacuum system equipment left connected to system.

CHARLES TOWN UTILITY BOARD ON-CALL WATER & SEWER TASK 19B – 2016 SEWER PROJECT JEFFERSON COUNTY, WV

Client: Charles Town Utility Board

Contact: Joe Burris | 832 S. George Street, Charles Town, WV 25414 | 304.676.6890

Dates: 2017

Key Team Members: John Cole, Brandon Felton

The 2016 Sewer Project consists of the construction of three (3) new sewer lift stations and associated gravity collection and force mains for conveying raw sewage collected from both the Sanitary Associates Sewer Service Area and Willow Springs Sewer Service Area to the existing Charles Town WWTP for treatment. The project also included the demolition of three (3) existing sewage lift stations, two (2) of which were failing, modifications to an existing sewage lift station, and the demolition of the existing Willow Spring WWTP for complying with a consent order from the WV Department of Environmental Protection.

Prior to the project, sewage from the Sanitary Associates Service Area gravity fed into to the adjacent Jefferson County Public Service District (District) sewer utility for eventual transportation to the Charles Town WWTP for eventual treatment. Two sewage lift stations within the service area were failing and required complete replacement. In addition, one of the District's sewer lift stations was exceeding design capacity resulting in sewage backups. To assist the District, CTUB redirected the sewage collected from the two failing lift stations to the Willow Spring Service Area whereby removing approximately 40,000 gpd of sewage from the District's lift station.



Sewage within the former Willow Spring Service Area was treated at the Willow Springs WWTP which was a 100,000gpd package aeration treatment facility. With the additional sewage flows from the Sanitary Associates Service Area and operational issues with the WWTP the CTUB decided to decommission the plant and redirect all sewage flows to the Charles Town WWTP for treatment.

The project involved the design and construction of three new sewage lift stations, each with emergency back-up generators and bypass connection capabilities; construction of approximately 4,700-LF of 12" dia. gravity sewer collection; construction of approximately 9,400-LF of 6" dia. sewer force main; installation of a sewer SCADA system; construction of 580-LF of 24" dia. steel casing under two separate 4-lane divided highways; and modifications to an existing sewer lift station.



CAROLINA & IDAMAY SEWER SYSTEM REPLACEMENT MARION COUNTY, WV

Client: Greater Marion Public Service District

Contact: Carol Brooks | 44 Aberdeen Drive, Worthington, WV 26591 | 304.287.2244 | mommaredsquirrel@msn.com

Dates: 2014

Key Team Members: Dave Vanscoy, John Cole, Matt Youngblood, Brandon Felton, Andrew Suter

The Greater Marion Public Service District (GMPSD) retained RK&K as their engineering consultant to perform a study of their sewer collection system; focusing on the collection systems within the Communities of Carolina and Idamay. The study consisted of evaluating the vacuum collection system that was constructed in 2000, which replaced an older gravity collection system and eliminated two individual treatment facilities.

The Community's sewer system – constructed in 2000 and consisting primarily of vacuum collection – was failing, causing very unreliable service to the customers of the GMPSD. Significant inflow and infiltration flows from the customers contributed to the problems. The GMPSD consulted RK&K and it was determined that the best solution was to replace the existing vacuum collection system with a conventional gravity collection system.

In addition to converting the existing vacuum collection system to gravity, a sewage pumping station was required to convey the sewage to the community of Carolina for further transfer and treatment. The Idamay pumping station was designed to handle a peak flow of 130 gallons-per-minute at 370' TDH. Due to the high operating head situation, a Smith & Loveless wet well mounted pump station utilizing Duplex Twin – 50 HP vacuum prime pumps mounted in series was used. The pump station conveys the sewage through dual 4" C900 PVC/Class 305 force mains protected by surge relief valves that relieve high surge pressures by diverting sewage back to the wet well when force main pressures exceed the pre-set surge pressure set point of the relief valve.

This project featured two unique aspects: (1) elimination of a relatively new failing vacuum collection system and (2) construction of 6,300 LF of pressure sewer. Due to the topography of the region and in an effort to minimize the size of the pumps within the Carolina PS, the pumps were designed to convey sewage 50-ft in elevation above the pump station. From the high point, the sewage will flow by gravity/pressure sewer through a vertical drop of nearly 350-ft. The pressure sewer portion is the result of the alignment crossing under the West Fork River just prior to the Worthington WWTP.



NORTHERN MINERAL COUNTY REGIONAL SEWER SYSTEM MINERAL COUNTY, WV

Client: Frankfort Public Service District

Contact: Rae Corwell | PO Box 80, Wiley Ford, WV 26753 | 304.738.9552 | rcorwellfpsd@atlanticbb.net

Dates: Ongoing

Key Team Members: Dave Vanscoy, John Cole, Matt Youngblood

In 2001, the Mineral County Commission in West Virginia requested that the Frankfort Public Service District (FPSD) investigate the feasibility of developing a sewage collection and treatment system in northern Mineral County. RK&K was hired to conduct the sewer feasibility study.

The objective of the study was to define sewage treatment needs from the perspective of public health and safety while ensuring the environmental health of local waterways. The study area covered approximately 35 square miles and fourteen sewage treatment plants with affiliated infrastructure. Eleven of these sewer systems had serious systemic deficiencies, which resulted in raw sewage spills, lethal toxicity to aquatic life, sewage backups into structures, improper treatment, and violations of the facilities' respective National Pollutant Discharge Elimination System (NPDES) permits.



The project area contained 2,576 customers representing 3,058 equivalent dwelling units, both residential and commercial. Sewage service for those residents and businesses was provided at that time by the Fort Ashby wastewater treatment plant, 13 other individual treatment plants, and individual septic systems.

RK&K evaluated the collection system and treatment plant specifications necessary for comprehensive sewage collection and disposal in the project area. Development of a facility plan for the proposal ensued.

During the design of the regional project, the FPSD submitted a plan for the entire regional sewer system that envisioned the elimination of the fourteen existing wastewater treatment facilities, which would be superseded by the construction of a 1.2 million-gallon-per-day (MGD) wastewater treatment plant, 63 miles of sewer lines (of diameters ranging 6" through 21"), and fourteen sewage lift stations divided among nine sewer sheds covering 35 square miles.

The problem of obtaining adequate funding while maintaining affordable user rates within any single fiscal year became apparent early in the design process. A recommendation was therefore made to divide the entire project into multiple phases to increase the likelihood of incrementally securing the project funding necessary for construction.

Collaboration between the FPSD and RK&K has been ongoing to the present time. RK&K continues to serve in the capacities of planning, design, preparation, construction management, and associated duties. To date, two of three planned phases of the Northern Mineral County Regional Sewer System (NMCRSS) project have been completed.

Phase I: Phase I of the NMCRSS project allowed for the construction of approximately 13 miles of interceptor sewer lines (8" through 21" diameter), one remote sewage pump station, and the construction of a 0.6 MGD regional wastewater treatment plant. The total

population served by this phase of the project is nearly 7,500 people, representing approximately twenty-five percent of the Mineral County population.

Significant challenges in permitting, funding, design and construction were overcome to provide a cost-effective treatment method of meeting State nutrient loading limitations while minimizing the impact to the surrounding area and the financial burden on the District's customers. The Sequencing Batch Reactor (SBR) biological process was utilized as the primary means of treatment, incorporating both chemical addition to enhance the nitrification process, and filtration to enhance phosphorus removal. This design resulted in the FPSD plant becoming the first treatment facility to be specifically designed, constructed, and placed into successful operation within the State of West Virginia in accordance with the State's limitations on nutrient loadings (5 mg/L of total nitrogen and 0.5 mg/L of total phosphorus) entering the Chesapeake Bay. The treatment plant process comprises an influent pumping station, a rotating mechanical fine screen, vortex grit removal, SBRs, continuous backwash up-flow sand filters, UV disinfection, cascade aeration, aerobic digestion, and belt-filter-press. Concurrent with construction of the plant's processing components, an operations building complete with testing laboratory was erected, as were chemical storage facilities and a maintenance garage. In recognition of this design, the FPSD project received a 2011 Silver Award for Engineering Excellence from the American Council of Engineering Companies of West Virginia.



Despite challenging site conditions, the wastewater treatment plant (WWTP) was operational in June of 2011 (15 months after Notice to Proceed).

Phase II: The second phase included the addition of 800 new customers, elimination of the five remaining antecedent wastewater treatment facilities, and construction of six remote sewage pump stations and an additional 30 miles of sewer collection lines. Additionally, the treatment capacity of the new WWTP was expanded from 0.6 MGD to 1.2 MGD. The WWTP expansion involved the construction of two additional SBR tanks, one digester, four more sand filters, and additional UV disinfection capacity. Phase II of the regional project was completed in April of 2016 (13 months after Notice to Proceed).

Funding: Due to the high anticipated cost (in excess of \$52 million), the regional project was divided into multiple phases in an effort to secure the necessary funding. Phase I of the project cost approximately \$18.22 million, while Phase II cost \$26.95 million. The planned third phase of the project has an estimated construction cost of \$16 million.

Associated Work: Phases I and II of this project necessitated the acquisition of several private sewer systems, a wastewater treatment plant site, and 7 pump station sites. RK&K completed land surveys, prepared plats and legal descriptions, and supported attorney and owner during the procurement process. In addition to these acquisitions, 111 right-of-way easements were required for Phase I, and Phase II required over 800 easement agreements. RK&K coordinated the acquisition process among attorney, right-of-way agents, and owner. In a limited number of instances where land was acquired through the mechanism of eminent domain, RK&K provided court testimony.

CHARLES TOWN UTILITY BOARD ON-CALL WATER & SEWER TASK 17 TUSCAWILLA WWTP TROUBLESHOOTING & PROCESS UPGRADES CHARLES TOWN, WV

Owner: Charles Town Utility Board

Contact: Joe Burris | 832 S. George Street, Charles Town, WV 25414 | 304.676.6890

Dates: 2014 - 2015

Key Team Members: John Cole, Kelly Duffy, David Wacker, Dave Vanscoy

The Tuscawilla Wastewater Treatment Plant is located in Charles Town was upgraded (by others) in 2013 from an aerated lagoon to a membrane bioreactor with an average daily design capacity of 0.5 MGD. Since start-up of the MBR system, Tuscawilla WWTP has experienced non-steady performance and failed to consistently meet their BNR effluent limits for total nitrogen. Additionally, chemical consumption far exceeded the design figures and dramatically increased the Owner's operation costs. In an effort to meet total nitrogen limits and reduce chemical costs, as part of an on-call contract, the Charles Town Utility Board (CTUB) retained RK&K to troubleshoot the membrane bioreactor operation and design necessary upgrades.

Engineering Services: The RK&K Team evaluated the process design to ensure that the biological reactor was adequately designed. Both spreadsheet type calculations and BioWin process modeling were used to evaluate the design. The evaluation determined that the reactor tankage design was sufficient to meet BNR effluent limits.

In order to troubleshoot the process, RK&K performed onsite testing for several process control variables and advised the operators to make minor process control adjustments. During this time RK&K worked closely with the membrane manufacturer in order to properly advise the operators. Through this collaboration, it was determined that all three membrane units were not required to operate at once. With all three membrane units in service, an excess of dissolved oxygen was being recycled to BNR tank inhibiting denitrification. RK&K recommended that only two membrane units be in service at once and to reduce to the dissolved oxygen set points. Since the operational modifications were made, effluent total nitrogen has consistently remained under 5 mg/L.

RK&K worked with the CTUB to troubleshoot low flow conditions and its effect on permeate pumping rates as well as freezing issues during low flow conditions.

Following the operational troubleshooting, the CTUB asked for recommendations for capital upgrades. RK&K recommended the installation of nitrate probes and submersible mixers in order to increase denitrification rates and reduce supplementary carbon addition. RK&K completed the design of the probe and mixer installation, as well as the necessary electrical improvements. Tuscawilla WWTP now has increased process control and requires less supplemental carbon for denitrification.



GREENSBORO REGIONAL WASTEWATER SYSTEM CAROLINE COUNTY, MD

Owner: Town of Greensboro, Maryland

Contact: David Kibler | 111 South Main Street, Greensboro, MD 21639 | 410.482.6935 | dkibler@greensboromd.com

Dates: 2012 - 2016

Key Team Members: Michael Myers, Kelly Duffy, Justin Reel

The Town of Greensboro Regional Wastewater System (RWS) is a newly constructed project located in Caroline County, on the Eastern Shore of Maryland, in the Chesapeake Bay drainage area. The project consisted of a new WWTP, pumping station and conveyance system from the former WWTP and new collection/conveyance system to serve an adjacent town currently served by failing septic systems.

The new WWTP is designed for an average daily flow of 0.332 MGD and provides limit of technology levels of nutrient removal to meet effluent requirements of 3.0 mg/l TN and 0.3 mg/l TP. The former WWTP did not provide nutrient removal, experienced flooding during Hurricane Irene, and was on a land-limited confined site.

The new WWTP construction value was approximately \$7.5 million. The WWTP was constructed on a large, isolated parcel purchased by the Town which is located above the 500 yr. flood plain. Treatment systems include vortex grit removal, SBR system, denitrification filters, cascade post aeration, UV disinfection, and chemical storage and feed systems including methanol, alum, phosphoric acid and sodium hypochlorite. Reed beds are used for sludge treatment/storage.

The SBR utilizes jet technology provided by Evoqua. Two SBR basins were provided. The SBR tanks were constructed integral with the post equalization basin and sludge holding tank in a single, compartmentalized circular structure for cost savings. The Blower Building was constructed adjacent to the SBR tankage and houses the jet motive pumps, blowers, electrical room, and chemical feed equipment.

Four continuous backwash flow filter cells are utilized for denitrification. On-line nitrate and phosphate analyzers are utilized to control methanol and alum feed. Phosphoric acid is available, but is not typically utilized. Filter effluent is discharged through a cascade system for post aeration. Utility water pumps and a drain pumping station were also provided.

The new WWTP was started-up in December 2016 and is meeting enhanced nutrient removal limits.

The project was funded by grants and loans from the United States Department of Agriculture, MDE and Community Development Block Grant. The Town obtained the funding through multiple years of planning. RK&K served as the Town's engineer throughout the project and provided inspection services during construction.



POWHATAN WASTEWATER TREATMENT PLANT UPGRADES STATE FARM, VA

Owner: Virginia Department of Corrections

Contact: Jim Schrecengost | PO Box 26963, Richmond, VA 23261 | 804.674.3102 | james.schrecengost@vadoc.virginia.gov

Dates: 2009 - 2014

Key Team Members: Michael Myers, Kelly Duffy

RK&K completed the design of an upgrade for the Powhatan WWTP that is owned and operated by the Department of Corrections. The WWTP serves the Powhatan Correctional Center. The project included upgrades necessary to comply with the Chesapeake Bay effluent nutrient limits which are 6 mg/l total nitrogen (TN) and 0.5 mg/l total phosphorus (TP). The project also included a new operations building with laboratory and site improvements to provide an improved access road and drainage.

The Powhatan WWTP was an extended air, suspended growth facility designed for an average daily flow of 0.465 MGD and operating at a flow of approximately 0.3 MGD. Treatment included influent screening, flow equalization, biological treatment using intermittent aeration, clarification using three 25 foot diameter clarifiers, post clarification and ultraviolet radiation (UV) disinfection. Dry powder alum was fed for phosphorus removal. Sludge was aerobically digested, dewatered and stored offsite. The facility was not originally designed for intermittent aeration, but plant operations staff manually adjusted the air control system to cost effectively provide a high degree of nitrogen removal.

The RK&K Team evaluated the existing facility to determine if the existing intermittent aeration and chemical feed systems were sufficient to meet the new effluent requirements. The team analyzed influent data, characterized influent loads, and evaluated existing operating data and effluent data. The team created mass balances and used spreadsheet analyses of denitrification and nitrification capacities. It was determined that new continuous backwash filters would be provided and used for solids removal at current flows. As flows increase to the design flow and the denitrification capacity of the reactors decreases, the filters will be used as denitrification filters with the addition of supplemental carbon.

A new liquid alum storage and feed facility was provided to eliminate problems associated with the powdered system. Aeration system controls and monitoring were upgraded and automated.

A new operations laboratory building and dewatered cake storage facilities were also provided.

Construction was completed in 2014 and the facility has been meeting the goals of the project.



WINEBRENNER WASTEWATER TREATMENT PLANT WASHINGTON COUNTY, MD

Client: Buchart Horn, Inc. / Basco Association **Owner:** Washington County, Maryland

Contact: Mark Bradshaw | 3700 Koppers Street, Suite 305, Baltimore, MD 21227 | 240.313.2600 | mbradshaw@washco-md.net

Dates: Completed 2016

Key Team Members: Michael Myers, Kelly Duffy, Kevin Nash

The Winebrenner WWTP is located along Pen Mar Road near Fort Ritchie in Cascade, MD and has a design capacity of 0.60 mgd. The plant formerly utilized rotating biological contactors (RBCs) prior to upgrading for nutrient removal. Nearly all flow is from communities served by septic tank effluent pumping (STEP) systems. Only a small portion of the flow from the military base, Fort Ritchie, consists of raw sewage. The plant historically nitrified year-round, but operated at flow rates well below design capacity. The plant has significant I&I (Influent and Infiltration), particularly during winter snow melts.

New development at Fort Ritchie is planned for upcoming years and will include primarily residential users served by a new collection system. As a result, the plant upgrade was planned for normal strength residential wastewater. The plant was upgraded for enhanced nutrient removal for an effluent concentration of 3 mg/l total nitrogen and 0.3 mg/l total phosphorus (annual average).

The former liquid treatment consisted of manual bar screening, aerated grit removal, flow metering using a Parshall flume, off-line flow equalization for high flow events, primary clarification, aerated RBCs, secondary clarification, chlorination, dechlorination, and cascade post aeration with discharge to Falls Creek. Sludge was wasted to two aerobic digesters and disposed of by hauling to the Conococheague WWTP. There were covered sludge drying beds which are used only for back-up purposes.

Of significance, the plant is bisected by an embankment for railroad tracks, originally owned by Western Maryland Railroad, with the headworks, flow equalization tank, primary clarifiers and sludge system located on one side and the RBCs, secondary clarifiers and disinfection system located on the other side. There was limited room for new improvements and the site of the drying beds was re-purposed.

The initial ENR process evaluation included evaluation of three types of systems to replace the RBCs: 1) sequencing batch reactors followed by denitrification filters, 2) oxidation ditch using the Eimco Carrousel configuration, and 3) biological aerated filters for nitrification followed by un-aerated biological filters for denitrification. The evaluation concluded the SBRs followed by denitrification filters to be the least cost alternative but the overall costs were high. As a result, a long-term, full scale pilot of a ballasted activated sludge system was completed using the BioMag process. The full scale pilot was the first test of applying the BioMag technology in a nutrient removal facility with anoxic zones.

Subsequent to the successful ten-month pilot test, a second evaluation was performed and the BioMag was selected as the lowest cost alternative. Utilizing the BioMag technology allowed the existing clarifiers to be reused, reduced the footprint of the new reactor, and eliminated the need for filters. The BioMag system was configured for use in a Four-Stage Bardenpho reactor system. The system was designed for the varying influent flows experienced.



REFERENCES

In addition to the references noted on the project profile sheets above, RK&K is pleased to provide the following professional references to demonstrate successful experience on other projects. We encourage you to call each client to further articulate the value RK&K provides. Please ask about not only the technical credentials of our staff, but also our commitment to schedule compliance, cost performance and communication.

CLIENT	CONTACT/ADDRESS	PHONE/E-MAIL
New Creek Public Service District	Jeremy Shingler, General Manager 4242 New Creek Highway Keyser, WV 26726	Phone: 304.790.9333 ncpsdvw@gmail.com
Town of Oakland	Gwen Evans, Executive Coordinator 15 South Third Street Oakland, MD 21550	Phone: 301.334.2691 townofoak@gmail.com
Greater Marion Public Service District	Carol Brooks, Manager 44 Aberdeen Drive Worthington, WV 26591	Phone: 304.287.2244 mommaredsquidrel@msn.com
Frankfort Public Service District	Jerry Frantz, Treasurer 5 County Route 28/10 Ridgeley, WV 26753	Phone: 304.738.9552 jerryfrantz@frontier.com