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Morgantown, WV 26508
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SKELLY AND LOY
ENGINEERING - ENVIRONMENTAL CONSULTANTS

Phone: 304-296-6500
Fax: 304-381-4197

June 13, 2016

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

Re: Centralized Expression of Interest
DNR1600000021
Watoga – A/E Services Riverside Campground Wastewater Plant

Dear Mr. Nisbett:

Skelly and Loy, Inc. is pleased to submit the enclosed Centralized Expression of Interest (CEOI) to provide professional related services to the subject project.

Skelly and Loy has more than 47 years of experience providing civil/municipal engineering and environmental services to clients throughout the Middle Atlantic region with notable past success in water and wastewater system planning, design, and construction oversight. We first established our West Virginia office in the late 1970s. We have been providing services to West Virginia clients from our office in Morgantown since 1998 and are very familiar with the region.

We are confident that we have assembled the most appropriate local team to provide your engineering needs. We appreciate the opportunity to present these qualifications to you and look forward to participating in the next phase of the selection process. If you have any questions or require additional information, please contact me at 304-533-0669 or dmiller@skellyloy.com.

Sincerely yours,

SKELLY and LOY, Inc.

Daniel L. Miller, P.E.
Senior Environmental Engineer

Enclosures
cc: Gerald Longenecker
Sandi Bell/Margy Coyne
Jacque Foster
R16-0278.P00
File: WATOGA_DLM.docx

06/15/16 09:34:35
WV Purchasing Division

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: DNR 1600000021

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

[✓] Addendum No. 1	[ ] Addendum No. 6
[ ] Addendum No. 2	[ ] Addendum No. 7
[ ] Addendum No. 3	[ ] Addendum No. 8
[ ] Addendum No. 4	[ ] Addendum No. 9
[ ] Addendum No. 5	[ ] Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Skelly and Loy, Inc.
Company

Authorized Signature

June 13, 2016
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012

CENTRAL EXPRESSION OF INTEREST OVERVIEW

The West Virginia Purchasing Division is soliciting Expressions of Interest (EOIs) for The Division of Natural Resources (DNR or Owner) from qualified firms to provide architectural/engineering services. The mission or purpose of the project for which bids are being solicited is to provide necessary engineering and other related professional services to design and provide construction contract administration services to replace a wastewater treatment plant at Watoga State Park (Project).

The requested response is to detail information regarding the firm's qualifications and experience. To assist the reviewer, the following table details the opportunity's requested information and the specific location of where this information can be found within our proposal.

REQUIRED INFORMATION TO DETAIL	LOCATION OF RESPONSE
Its employees, such as staff qualifications and experience in completing similar projects;	General information regarding the firm is presented within this section. Information regarding the team companies is in the section entitled *"Technical Experience"*. Information regarding the specific team staff as well as the Organization Chart is in the section entitled *"Expertise of Staff"*. Information regarding the key staff in charge is presented within *"Persons in Charge"*.
References;	References are provide within the section entitled "References" as well as specific project references which are included as requested within the projects descriptions in *"Previous Professional Experience"*.
Staff certifications or degrees applicable to this project;	A summary of certifications, licenses, and degrees is presented in the table of the Key Staff located within the section *"Previous Professional Experience"*. Copies of certifications and licenses can be found in "Persons in Charge of the Project".
Proposed staffing plan;	Information regarding the proposed organization of the project team is within the section entitled *"Expertise of Staff"*. Resumes are provided for each key individual.
Descriptions of past projects completed entailing: • the location of the project, • project manager name and contact information, • type of project, and • what the project goals and objectives were and how they were met.	Projects descriptions are located within the section entitled *"Previous Professional Experience"*.

In addition to the above, the response was to demonstrate:

a. A clear procedure for communication with the owner during all phases of the project; this information is provided within the section entitled *"Compliance Plans to meet Project Goals"*.

b. A history of projects that met the owner's budget and describe in detail a clear plan to ensure this project can be constructed within the project budget; this information is provided within the section entitled *"Previous Professional Experience"*.

c. A history of projects that have been constructed in the time allotted in the contract documents and describe in detail a clear plan to ensure this project will be constructed within the agreed construction period; this information is provided within the sections entitled *"Compliance Plans to meet Project Goals"* and *"Previous Professional Experience"*.

d. Competent and acceptable experience in all expected professional disciplines necessary for the design and completion of the project; this information is provided within the sections entitled *"Expertise of Staff"* and *"Previous Professional Experience"*. Specifically refer to the table within *"Previous Professional Experience"* which presents project elements contained within and comprising each project and the proposed team's experience within those project elements.

The solicitation identifies the project goals and objectives to be:

- **Goal/Objective 1:** Review existing plans and conditions as well as the operation of the park and evaluate while communicating effectively with the owner to determine a plan that can be implemented in a manner that will minimize disruption to concurrent operation of the facility and meet all objectives.

- **Goal/Objective 2:** As a portion of this process outlined in Objective 1, provide all necessary services to design the facilities described in this EOI in a manner that is consistent with The Division of Natural Resources needs, objectives, current law, and current code; while following the plan to design and execute the project within the project budget.

- **Goal/Objective 3:** Provide Construction Contract Administration Services with competent professionals that ensures the project is constructed and functions as designed.

Section Three of the solicitation provides this additional information regarding the background of the project. The Division of Natural Resources operates State Parks and related facilities at the above referenced locations. The DNR desires to replace a Wastewater Treatment Facility located at and serving Riverside Campground. The existing facility is a 1970s era 10,500-gallon per day extended aeration plant. A replacement facility is necessary because of the poor condition of the plant. The DNR desires to consider alternative technologies and changes in the contributing waste sources to obtain a treatment system that is both effective and economical. Address for each entity are cited as:

- Agency is located at 324 4th Avenue, South Charleston, WV
- Watoga State Park, 4800 Watoga Park Road, Marlinton, WV 24954-5962

In response to the request for an EOI, Skelly and Loy, Inc. is pleased to provide this Statement of Qualifications regarding our project team and to express interest in providing the solicited engineering services.

CENTRAL EXPRESSION OF INTEREST OVERVIEW

In reviewing the potential project work, Skelly and Loy identified the potential needs for the following engineering services.

- Preliminary design, design, construction contract administration, and inspection services
- Civil; process; mechanical, electrical, and piping; instrumentation and controls; and structural engineering services
- Survey and geotechnical services

Skelly and Loy is capable, experienced, and well respected for providing all of these services. Skelly and Loy is locally based in Morgantown and has a long history of working throughout West Virginia. We have project experience in 47 of West Virginia's 55 counties including Pocahontas County, where Watoga State Park is located. We believe that the following information will convince the selection committee that Skelly and Loy should be interviewed. We are further confident that, once interviewed, the committee will also agree we are the proper Team to provide the DNR with cost-effective and efficient engineering support for your important improvement projects.

CENTRAL EXPRESSION OF INTEREST OVERVIEW

SKELLY AND LOY, INC. FIRM OVERVIEW

Prime Firm:	SKELLY and LOY, Inc.
Local Office:	**240 Scott Avenue, Morgantown, West Virginia 26558**
Corp. Headquarters:	449 Eisenhower Boulevard, Suite 300, Harrisburg, Pennsylvania 17111
Business Size:	Woman-owned, large business (NAICS 541330 Eng. Services)
Point of Contact:	**Daniel L. Miller, P.E.**
	P: 304-533-0669; F: 304-381-4197; C: 304-533-0669;
	E-mail: dmiller@skellyloy.com

Established in 1969, Skelly and Loy is a privately owned, mid-sized corporation with six Middle Atlantic offices. Skelly and Loy is an award winning firm, providing a myriad of professional engineering and environmental services to various public and private sector clients throughout the United States and abroad. As trends change and markets emerge, Skelly and Loy continues to build on its strong foundation and enhances its offering of professional services of civil, environmental, and mining engineering; National Environmental Policy Act (NEPA) compliance studies (EISs, EAs, CEEs, etc.); natural resources management including wetlands, aquatic studies, and wildlife management; environmental, mining, water, and wastewater permitting and design services; noise and air quality investigations; waste management investigations and remedial design; archaeological, cultural, and historical studies and documentation; digital information technology; and equipment sales, installation, operation, and maintenance of municipal, industrial, commercial, and private water, wastewater, and remediation treatment systems. Experts with broadly based experience and sound technical skills work closely together to produce the superior work for which the firm is well known. Client requirements and desires are always kept foremost by working closely with them to develop the project. The cooperation between Skelly and Loy professionals and clients allows cross-pollination of ideas from many fields of expertise as well as from the client's own particular insight and experience. In each task undertaken, project personnel are carefully chosen to encompass the full range of disciplines required to completely analyze a problem and provide the best practical solution.

Our Principals

Sandra Loy Bell, Chief Executive Officer
John W. Gunnett, P.G. President and Chief Operating Officer

For this project, to best service the DNR, Skelly and Loy will serve as the prime and will subcontract to D.F. Staley (independent contractor), Triad Engineering, Inc. and Allegheny Design Services. Our experienced staff, together with our team partners' experienced staff, will provide the best possible mix of experienced environmental compliance, surveyors, scientists, engineers, and inspectors who are familiar with wastewater treatment, collection systems, pumping stations, and electrical and building design. Among the teaming partners there are some redundant service capabilities which will enable us to provide the best possible mix of cost-effective and efficient solutions to your overall engineering service needs.

In the following section, we discuss Skelly and Loy's and our teaming partners' technical experience.

CENTRAL EXPRESSION OF INTEREST OVERVIEW

TECHNICAL EXPERIENCE

Firm Experience Overview

The project primarily involves the replacement of an existing wastewater treatment system located at and serving the Watoga State Park's Riverside Campground. Our years of experience have shown us that, although this may sound like a simple process, there are subtleties, restraints, and potential benefits that only experience can teach. Our team members have extensive professional experience, and our proposed project leader has more than 35 years of personal experience related to water and wastewater system designs. Our tenured staff brings experience of how to handle nearly any project subtlety and restraint while maximizing benefits – all resulting in improved project efficiency, optimized operations and maintenance, and ultimately a lower bottom line. We understand how to build the project from the conceptual stage, all of the way to project construction and operation. Our firm's familiarity with property ownership, rights-of-way, easements, geotechnical issues, operational and maintenance issues, cost considerations, redundancy, serviceability, expandability, and future needs, to mention just a few, prevents project overruns and ensures projects can be completed on time and within budget.

For nearly five decades, Skelly and Loy has developed a reputation for integrating client needs into innovative designs that minimize project life cycle costs and environmental impacts by optimizing performance and infrastructure sustainability. We take great pride in our long history of client satisfaction, which has been built upon the simple premise of producing high quality work on-time and within budget.

Skelly and Loy's Value-Added Services

With all of our projects, we provide value-added services, savings opportunities, and out-of-the-box thinking not found with other engineering firms. Our team carefully integrates client needs into a design that minimizes life cycle costs, including upfront capital costs as well as operations and maintenance costs. We feel that our past project experience and successes are the best way to illustrate our unique benefit to our clients:

- **Fairmont to Rivesvillle Water Supply Line – Multi-Municipality Collaboration:** Skelly and Loy coordinated with multiple municipalities, including the City of Fairmont, Rivesville, and the Paw Paw PSD, as well as state agencies including the West Virginia Department of Highways (DOH), Department of Environmental Protection (DEP), and the Infrastructure and Jobs Development Council (IJDC) to develop a project plan that worked best for all communities in the region. Our project eliminated unnecessary parallel supply lines, negated unnecessary maintenance costs, and significantly increased supply capacity for the region.

- **Rivesville Emergency Supply Line Replacement:** The Town identified a waterline breakage of 75,000 gallons/day. Skelly and Loy rapidly deployed a capable design that resulted in a very quick issuing of a railroad crossing permit, 100% grant funded project, and construction oversight that led to repairs that saved Rivesville over $6,000/month.

- **White Township Municipal Authority Sewer Line Project:** As project manager, Dan Miller reviewed a proposed parallel interceptor design and suggested an alternative approach that improved the existing interceptor. Dan's final design resulted in a project savings of over $1.5 million (approximate 30% cost reduction).

- **Infrastructure "Health" Assessments:** For minimal upfront cost, we have assessed infrastructure health at over a hundred sites. Our work with clients has led to prioritizing failure risk and modernizing improvement plans that utilize life cycle cost and risk based asset management.

- **Least Cost Combined Sewer Overflow (CSO) Approaches:** We have helped clients locate least cost opportunities to prevent CSOs. Our solutions include stream removal and "lowest hanging fruit" green stormwater infrastructure that remove massive quantities of stormwater from combined sewers, and ultimately saving millions of dollars by preventing grey infrastructure and treatment plant capacity increases.

- **Skelly and Loy's After Market Services (AMS):** Skelly and Loy's wholly owned subsidiary AMS performs construction, resident inspection, installation, operation, and maintenance of public and private water, wastewater, stormwater, and remediation treatment systems. As a result, Skelly and Loy is uniquely qualified since our firm works on projects ranging from engineering design to construction, inspection, and O&M. We are familiar with construction practices in house, and consequently our engineering designs integrate common approaches to simplify construction and reduce construction labor.

- **Subsurface Wastewater Discharge Systems:** Skelly and Loy has been designing and installing subsurface wastewater discharge systems for decades for commercial, residential, and municipal clients. Our comprehensive team includes a tenured soil scientist that is experienced with site soil sampling. We have experience with highly impermeable soils that were deemed by others to be unsuitable for subsurface discharge, and through thorough investigation, located a highly porous soil lens and enabled successful subsurface discharge. Further, we have helped many clients eliminate NPDES permit requirements through conversion to a subsurface discharge system.

- **Sustainability Assessments of Water and Wastewater Systems:** Our staff has worked with water and wastewater treatment plants of all sizes to evaluate system-wide infrastructure, water, and energy efficiency. Skelly and Loy staff has identified 5-year payback design and operational solutions that reduce plant energy consumption by greater than 25%.

These examples illustrate the value added services and detail that Skelly and Loy integrates into all of our projects. Our Team's experience and technical expertise will answer your questions each step of the way and will deliver a project that meets your needs and seamlessly serves your park. We will be pleased to share more of our expertise during the performance of your system upgrade project.

Understanding the DNR's Project Needs

Our project team will work closely with the DNR to understand and integrate your needs into each and every phase of the design and construction process. We truly will become an extension of your team.

From past submittals with the DNR's State Park water and wastewater treatment systems, we have learned several of the following key interests of the DNR. We look forward to the opportunity to continue these discussions with the DNR and better understand your key interests and needs specific to the Watoga State Park wastewater facility.

Statement of Firm's Qualifications

- **Key Features to Include**
  - Resilient, 'Bullet Proof' System
    - Robust
    - Flexible
    - Low maintenance
    - High reliability
      - Unmanned reliability
  - Reasonable Capital Cost
    - Limited budgets
  - Minimized Operating Cost
    - Operating budgets are getting tighter
    - Major cost labor and benefits

- **Desired Features for Many Systems:**
  - Parallel treatment trains, redundant systems, modular expansion
  - Zero Discharge – Eliminate NPDES
  - Seasonal Variability
    - Can handle large variations in flow/concentrations
  - Seasonal Use
    - Rapid start up

Some of the key design features we will include are:

- Exploration of alternative treatment technologies
- Low O&M labor/cost requirements
- Replace labor intensive:
- Bar screens, aeration plant (More automatic than manual)
- Utilize passive treatment, automated valving/dosing
- Simpler controls:
- Process driven controlling (pump floats, etc.)
- Cell phone based telemetry/metering
- Chlorination/dechlorination (UV as alternative)
- Reduce/eliminate chemicals and aeration cost/labor
- Reduce the number of NPDES permits
- Zero discharge (where feasible): subsurface discharge
- Treatment system flexibility for highly variable or seasonal flow
- Do not use conventional aeration.
- Utilize systems that can handle rapid start-up from low/no flow periods: Orenco AdvanTex, etc.
- Discussion of whether evaluation of contributing waste sources should be included
- Includes, but not limited to, grease traps, chemical dumping, food disposal
- When lower capital and O&M exist:
- Maximize, where feasible, reuse, greywater treatment, composting toilets
- Utilize alternative effluent gravity and pressure sewer systems (STEP/STEG)
- Flow reduction opportunities
- Current flowrates much lower than design capacity
- Improve water efficiency to minimize treatment needs
- Consideration of composting toilets
- Least Capital Cost
- Assess existing infrastructure health and integrate existing components that still have many years of life into the new design
- Designs that deliver least cost per gallon treated including upfront capital and O&M costs

Skelly and Loy is confident that we can expand these conversations with the DNR and deliver an engineer design that meets your needs and arrives at the least cost, most reliable system for your projects.

Skelly and Loy will work with the DNR to evaluate product technologies that best meet your capital and O&M needs. After our initial review of your primary needs, the Orenco product line, particularly their AdvanTex systems, meet the DNR's interest in alternative technologies and seasonal/highly variable flow requirements. Should future conversations with the DNR deem that Orenco's products are the best solution for a specific process or treatment system, Skelly and Loy can leverage their long-term relationship with Orenco and detailed understanding of their product offerings. Skelly and Loy has used many of Orenco's products in our designs in the past and we have already begun preliminary engineering/product specification discussions with Orenco for this project. Orenco's Jerry VanAucker and staff will provide a supporting role on our project. Should Orenco's products best meet the DNR's needs, Orenco will truly become an extension of Skelly and Loy's staff.

An Orenco letter of support and AdvanTex brochure can be found in the Appendix.

The next section provides an overview of the services offered by Skelly and Loy and our project team sub-consultant members: D.F. Staley (independent contractor), Triad Engineering, and Allegheny Design Services.

Statement of Firm's Qualifications

SKELLY AND LOY, INC.'S SERVICES

Engineering

- Civil Engineering - site development, construction stakeout, water management and treatment, permitting, and municipal services
- Environmental Engineering - waste handling, wastewater engineering, water supply, watershed assessments, hydrology/hydraulics, and natural stream restoration
- Mining Engineering - mineral processing, geology, mine development, feasibility evaluations

Geo-Environmental

- Environmental planning, design, construction, and documentation
- Noise and air quality
- Wetlands, streams, and permitting
- Threatened and endangered species
- Environmental impact assessments (NEPA)
- Section 4(f) evaluations
- Environmental compliance monitoring
- Planning
- Field surveys
- Technical writing
- Interagency coordination
- Public involvement
- Groundwater supply development and resource management
- Hydrogeologic investigations
- Site assessments
- Industrial compliance issues
- Underground storage tank management
- Industrial hygiene studies
- Remedial investigations
- Feasibility studies
- Remedial system design, installation, operation, and maintenance

Digital Technology

- CADD
- GIS
- Software development
- Website development/hosting
- Drafting
- Technical support
- Graphics, word processing, and publishing

Environmental

- Environmental planning, design, construction, and documentation
- Noise and air quality
- Wetlands, streams, and permitting
- Threatened and endangered species
- Environmental impact assessments (NEPA)
- Section 4(f) evaluations
- Environmental compliance monitoring
- Planning
- Field surveys
- Technical writing
- Interagency coordination
- Public involvement

Cultural Resources

- Geomorphological investigations
- Archaeological survey, testing, and evaluation
- Historic resource survey and Determinations of
- Eligibility and Effects
- HABS (Historic American Building Survey) and HAER (Historic American Engineering Record) recordations

AMS of Skelly and Loy, Inc. (a wholly owned subsidiary)

- Equipment sales
- Installation, operation, and maintenance of municipal, industrial, commercial, and private water, wastewater, and remediation treatment systems

OUR RELEVANT SERVICES AND EXPERIENCES

Civil Engineering, Planning, and Project Assessment

Skelly and Loy has a broad range of experience in meeting the DNR's requirements of West Virginia State Park wastewater treatment facilities. Experiences ranging from project concept and scoping to construction and operation makes Skelly and Loy well-suited to serve your project needs.

Skelly and Loy provides an array of related services which would assist in the planning, development, and implementation of your wastewater system improvements project which may include the following.

TECHNICAL EXPERIENCE

- Existing conditions assessment
- System evaluation and needs analysis
- Development of alternatives
- Project scoping
- Agency scoping and early coordination
- Environmental baseline surveys
- Cumulative effects assessments
- Assessment of environmental effects
- NEPA (EIS, EA, CEE) document preparation
- Mitigation planning and design
- Regulatory agency coordination
- Public participation/outreach
- Permit preparation and coordination
- Design
- Instrumentation and controls
- Bidding and negotiations
- Engineering during construction
- Resident Project Representative (inspection) services
- System startup
- Operation manuals
- Operations support
- One year certifications

Our staff's expertise, along with our facility resources, ensures the timely and successful completion of assessments to facilitate the development of projects, including the approvals of regulatory and resource agencies and the support of the public. In addition, the efforts that we undertake on behalf of our clients to ensure the success of their projects include the promotion of environmental stewardship and the assurance of public welfare and safety. To ensure the cost-effective completion of projects for our clients, we make use of a variety of tools including GPS, GIS, CADD, electronic data collection (e.g., laptop, Tablet PC, PDA), desktop publishing, computer-based modeling, computer-based database management, web-based project data applications, project website development, and computer-generated animation and visualization. Our experience developing design documents and bid packages has resulted in well-defined projects completed on time and within budget with minimal change orders.

D.F. STALEY – INDEPENDENT CONTRACTOR

D.F. Staley will serve as an independent contractor on our team to provide construction inspection services. D.F. Staley has been working with Skelly and Loy staff for over a decade and has assisted with construction inspection services for water and wastewater projects. D.F. Staley has been providing engineering design and construction inspection services for over 40 years for federal, state, municipal, and private clients. Skelly and Loy's project manager, Mr. Miller, has worked with D.F. Staley as the resident project representative for White Township, Pennsylvania for the past 8 years. Mr. Miller and D.F. Staley have also worked closely on a multitude of other projects, as detailed further in Mr. Staley's bio and resume in the following sections.

TRIAD ENGINEERING, INC.

Triad Engineering, Inc. (Triad) is an employee-owned, multi-disciplined engineering and earth-science firm specializing in civil engineering, geotechnical engineering, landscape architecture, drilling, environmental services, mining services, construction monitoring and testing, and surveying. Triad was founded in 1975 by 3 civil engineers and has grown to a staff of over 150 employee-owners located in multiple offices across the Middle Atlantic region. By providing a wide array of services and maintaining a staff of competent, well-trained professionals, Triad has developed long-term relationships with many satisfied clients.

TRIAD'S SERVICES

Triad was approached to join the team for two primary purposes: to provide geotechnical and survey-related services. Triad can also provide additional field technician, resident project representative (inspection), and construction-related testing services. Additional services that Triad can provide include the following.

- **Engineering:** Civil Site Design and Planning; Potable Water System Design; Wastewater System Design; Geotechnical Engineering; Landslide Investigation and Remediation; Dams and Impoundments; Mining- Related Facilities; Stormwater Design and Permitting
- **Environmental:** Groundwater and Soil Assessment and Remediation Design; Phase I/II ESAs; Brownfield Site Assessment; Asbestos, Mold, and Lead-Based Paint Inspection; Wetland and Forest Management Services; Regulatory Compliance Assistance and Permitting; Certified Industrial Hygienist
- **Drilling and Sampling:** Geotechnical and Environmental Drilling and Sampling; Monitoring Well and Piezometer Installation; Coal Reserve Drilling
- **Construction Monitoring and Testing:** Quality Control Monitoring and Testing of Soil, Concrete, Asphalt and Aggregate; Floor Flatness; Structural Steel; Paint and Fireproofing
- **Surveying and Mapping:** Topographic and Planimetric Mapping; Construction Layout; Subdivision Platting; ALTA/ACSM Surveys; Property Boundary Surveys
- **Landscape Architecture:** Master Plans and Land-Use Studies; Streetscape Improvements; Parks and Recreation; Disturbed Land Restoration; Trail Studies

ALLEGHENY DESIGN SERVICES

Allegheny Design Services (ADS) is a consulting engineering firm specializing in Structural and MEP (mechanical, electrical, and piping) building design and building analysis. Dedicated to serving West Virginia and the surrounding region, ADS recognizes the need for reliable and full-service engineering support. ADS provides all phases necessary for the successful completion of a building project including schematic design studies, design development, construction documents and specifications, and construction administration. ADS holds licenses to operate in West Virginia, Pennsylvania, Maryland, Virginia, the District of Columbia, South Carolina, and Ohio.

ADS was established by Mr. David Simpson, P.E., MBA, in 2002 as a result of a need in north-central West Virginia for reliable structural engineering services. In 2009, MEP engineering services were added, led by Mr. Mike Chancey, P.E. ADS utilizes a combination of office technology and a motivated staff to deliver projects that typically range up to $50 million in construction value. Its clients include architects, contractors, developers, attorneys, and insurance companies.

ADS' SERVICES

ADS was sought as a teaming partner to primarily provide structural and MEP (mechanical, electrical, and piping) engineering-related services. The firm has significantly broader capabilities. In this case, ADS will provide some redundant services as compared with the other teaming partners, enabling the opportunity to once again select the most cost-effective and efficient locally based team for any given assignment.

EXPERTISE OF STAFF

PERSONNEL AND AVAILABILITY

The Skelly and Loy Team has in-depth staff qualifications, certifications, and experience necessary to accomplish the tasks necessary to complete your project. The Skelly and Loy Team stands fully committed to providing the DNR with high-quality services in a cost-effective manner by selecting the proper mix of staff and maximizing our use of technology, innovative practices, and understanding of your needs.

Our team is familiar with your type of project conditions, has worked in the area, and understands the settings of the project. Of particular importance to the DNR, this project team has the experience, support personnel, and systems to manage design and inspection of a project of this complexity and magnitude. Our team is composed of engineers, soil scientists, resident inspectors, and construction staff who are familiar with all aspects of a wastewater treatment improvement project. Our particular experience with handling seasonal/highly variable flows, subsurface discharge systems, and engineering to simplify installation are a particular strength not found with other firms.

Our highly qualified personnel are familiar with your needs, have received numerous accolades for past projects, and have the required capabilities to provide all of the services in the CEOI solicitation. We employ a formal project management program which includes the use of formal work plans, in-house contracts with supporting company elements, and project scheduling software. Your project needs will be met by our proposed project team.

The team will be available to provide the DNR with the priority services warranted for this sensitive and critical overall effort to protect the health and safety of the users within the DNR's service area. As an additional level of assurance, significant overlap of capabilities exists throughout the various Skelly and Loy Team members as well as within each of the respective organizations themselves. This degree of overlap of talents provides an additional level of assurance to provide uninterrupted service and to respond to any potential personnel changes. A team organizational chart follows.

Our geographically diverse team is structured to provide quality services to the DNR with our office in Morgantown and support office in Pittsburgh, Pennsylvania; rapid and appropriate response to your needs is assured. Our corporate office in Harrisburg, Pennsylvania, has many duplicate talents available as needed. Each team member has an excellent reputation for providing technical expertise and efficient services and solutions for their clients.

The Skelly and Loy Team prides itself as being a team that communicates and cooperates with clients to meet their needs. Furthermore, we understand the benefits of having a close relationship with our clients in order to know and meet their expectations and to provide quality service. Satisfaction is defined by meeting a client's expectations, and we strive to meet or exceed your expectations.

The Skelly and Loy Team brings a long-standing teaming relationship. The working relationship of key individuals of the firms spans over 20 years. The Skelly and Loy team offers proven teaming experience to benefit this very important project.

PROJECT TEAM MEMBERS

The following individuals will support our project manager (Mr. Daniel Miller, P.E.) and principal-in-charge (Mr. Gerald Longenecker, P.E.). Information on Mr. Miller and Mr. Longenecker is provided in the next section.

Mr. Stephen Morse, P.E., has over 35 years of professional engineering experience. He has provided ongoing potable water and wastewater system engineering consulting for numerous existing municipal and privately owned potable water and wastewater systems. Services performed include operations consulting, infrastructure management/capital improvement plan preparation, capacity expansion (source, treatment, distribution, and storage) evaluations, budget and user rate evaluations, permit renewals, evaluation of impacts due to new regulatory requirements, and design of new facilities or modification to the system infrastructure.

Dr. Mark Pitterle, P.E., is a civil and environmental engineer with over 15 years of experience in design, construction, and installation of water, wastewater, and groundwater treatment systems. Dr. Pitterle has a diverse engineering background with project experience ranging in scale from small household systems to major centralized treatment systems exceeding 150 MGD. Dr. Pitterle specializes in optimizing the long-term sustainability of urban and rural infrastructure through design comparisons, infrastructure asset management, and water-energy nexus

optimization. He employs proven life cycle project optimization that improves efficiency and performance while minimizing life cycle costs.

Mr. Michael Lower, P.E., will serve as a professional engineer. His experience includes design of wastewater and potable water treatment solutions for industrial, municipal, and residential clients. As a result, his project experience encompasses a broad range of treatment systems both in size and complexity. On such engineering projects, Mr. Lower has determined the physical, biological, and chemical characteristics of the influent including flow rates and constituent concentrations. His responsibilities have included evaluating flow data in regard to hydraulics, effluent requirements, mass loading and solids balance, environmental constraints, equipment availability, O&M and construction costs, and personnel and energy requirements.

Mr. Daniel Aungst, P.E., will serve as a professional engineer and serves as Skelly and Loy's lead for the AMS group. He has more than 15 years of experience in environmental, civil, and construction projects. This experience has been gained through involvement in the planning, process design, preliminary design, detailed design, permitting, and construction phases. Mr. Aungst has experience in wastewater and potable water as well as soil and groundwater remediation. His experience with stormwater management and surface water quality, solid and hazardous waste and materials management, stream and ecosystem restoration, and land development projects will prove valuable to the team. During the design phase, Mr. Aungst utilizes his "hands-on" construction experience to provide value engineering services in order to develop pragmatic solutions and cost- savings alternatives. Mr. Aungst also provides construction oversight and technical support in the field during the implementation phase of these projects.

Mr. Luke Smeltz, C.P.S.S., is Skelly and Loy's lead soil scientist and will serve as the Survey and Geotechnical Lead for this project. Mr. Smeltz is a Certified Professional Soil Scientist with over 28 years of experience. His diverse background includes investigating soils and making interpretations for on-site wastewater and solid waste disposal, cultural resources investigations, stormwater management, beneficial land application of wastes and biosolids, wetlands delineations, and environmental site characterization and remediation. Mr. Smeltz has performed field investigations, often as principal investigator, on numerous soils and site evaluation projects, identifying and mapping the soils and making interpretations for various on-site uses and natural resource delineations. He has extensive experience in performing site investigations for on-site wastewater disposal systems including test pit soil profile descriptions, soil morphology interpretations, and percolation and permeability testing for both large community systems and individual residential systems.

Mr. D. F. Staley is an independent contractor and will serve as the lead Resident Project Representative. Mr. Staley, a native West Virginian, resides in Romney, West Virginia. He has numerous years of relevant experience. He has served as the lead inspector on many similar water system improvement projects which ranged in complexity from construction of entire water treatment plant facilities with associated lines and storage tanks to simpler water line extension projects. Mr. Staley and Mr. Miller first began working together in the late 1990s on the City of Romney Water System Improvements Project while working for a different engineering firm. Mr. Staley recently served as the Resident Project Representative for a showcase pumping station project that is being performed for Cranberry Township, Butler County, Pennsylvania. This work is being performed under a similar contract in which Mr. Staley is providing the services to the municipality on a project that was designed by another engineering firm. Mr. Staley is a key project team member for the DNR and is proposed as the primary RPR for this project.

Mr. Bradley Reynolds, P.E., currently serves as the Regional Manager for Triad's Northwestern and Northern Regions based in Morgantown, West Virginia and Pittsburgh, Pennsylvania. Mr. Reynolds will serve as the main point of contact for our teaming partner. In his capacity as Regional Manager, he is responsible for regional and personnel oversight and development, contract and technical reviews, and client and partner relations. Mr. Reynolds is experienced in project management, coordination, and supervision for the engineering, design, permitting, and construction of various mining, geotechnical, and environmental projects. His experience includes management of multiple geotechnical engineering projects including surveying and construction oversight.

As a senior engineer with over 26 years of experience, ***Mr. David W. Hooper, P.E.,*** serves as Triad's regional Geotechnical Engineering Services Manager and corporate Energy Market Services Leader. In this capacity, he is responsible for technical quality and management of geotechnical projects, which may also include services from the firm's drilling, laboratory testing, and field services groups. He also serves as the geotechnical and quality control services program manager for Triad's energy sector projects and is responsible for all technical and administrative

management duties associated with these clients. His technical work includes bearing capacity and settlement analyses, geophysical study implementation and analysis, shallow and deep foundation analysis and design, slope stability analyses, hydraulic and hydrologic evaluation for dam design, and preparation/review of geotechnical reports. His work also includes implementation and supervision of field drilling programs for the projects under his charge.

As Principal Engineer and the company's former CEO, ***Mr. Randy Moulton, P.E.*** is responsible for contract administration and overall quality control and technical quality assurance of projects undertaken by Triad Engineering, Inc. His specific technical activities include preparation of geotechnical proposals, review and/or preparation of subsurface exploration programs, evaluation of geotechnical data, and review and preparation of detailed geotechnical reports. His technical specialties also include design of deep foundations, in particular rock-socketed caissons, design of various types of retaining walls, evaluation of groundwater and seepage problems, and design of earth and earth-rock dams. Mr. Moulton is a Registered Professional Engineer in West Virginia, Pennsylvania, Maryland, Virginia, and North Carolina.

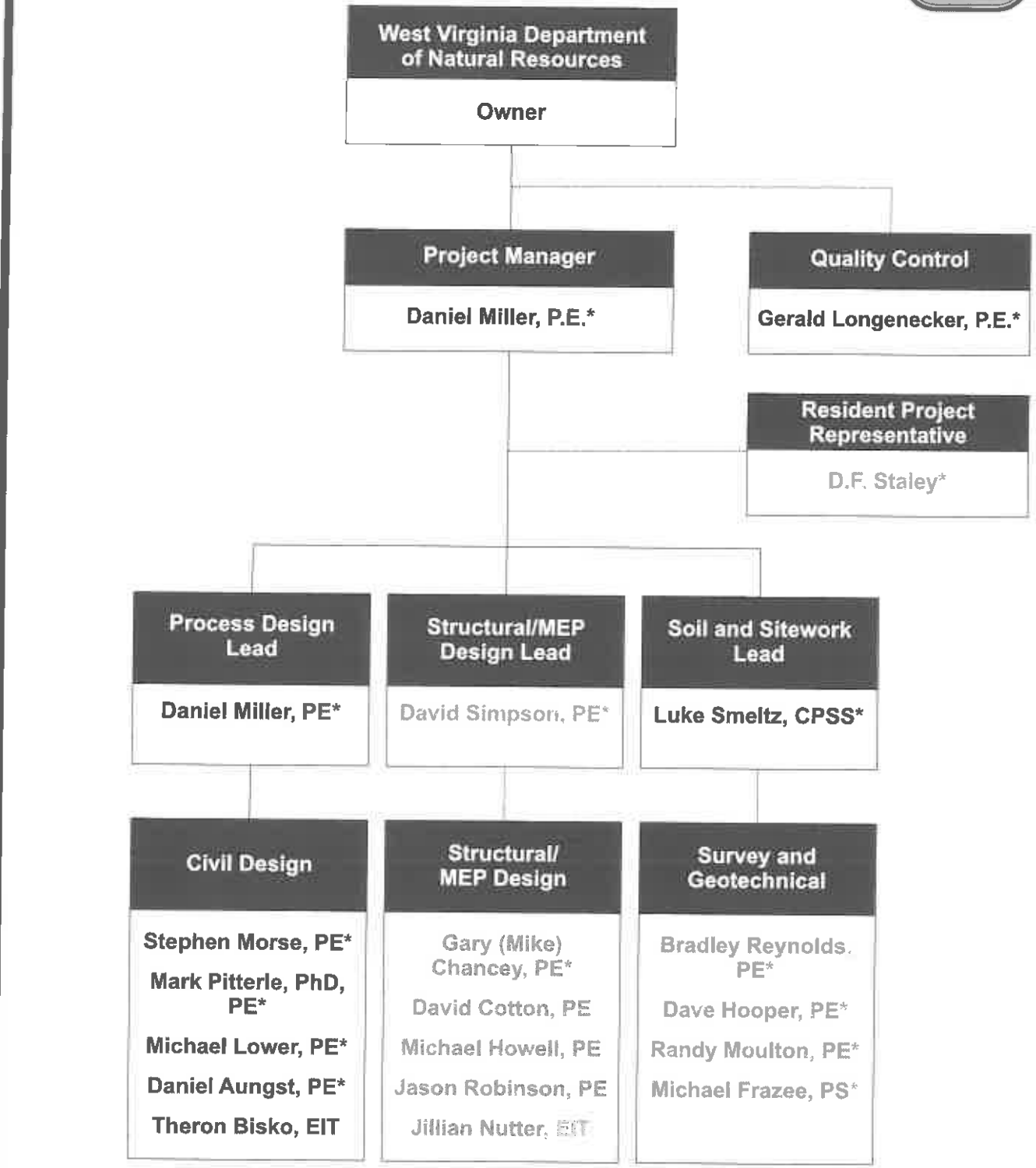
Mr. Michael D. Frazee, PS, serves as surveying manager for Triad's northwestern region. He has over 13 years of diversified surveying experience. He provides daily supervision of field crews and the coordination of field and office survey work. Mr. Frazee's responsibilities also include the supervision of boundary, right-of-way, topographic, as-built, and construction surveys; construction survey stakeout calculations; courthouse deed research; production of survey mapping; scheduling of field work and crew assignments; preparation of survey-related reports; and survey work estimates. Mr. Frazee has provided survey services to local and state agencies; private individuals; and large commercial, energy, and industrial companies.

Mr. David R. Simpson, P.E., SECB, MBA, and Founder and Principal Engineer of ADS, will serve as the lead structural engineer, quality control manager for ADS, and main point of contact for our teaming partner. Mr. Simpson is responsible for strategic management, marketing, quality control, personnel development, business development, project management, and design at ADS. His experience includes over 32 years in structural design and project management for industrial, commercial, institutional, and nuclear/chemical facilities utilizing steel, concrete, masonry, and wood. His past accomplishments include design and construction administration of health care facilities, hotels, schools, shopping centers, aircraft hangars, numerous retail facilities, and numerous forensic engineering assignments.

Mr. Gary M. (Mike) Chancey, P.E., LEED AP, is proposed as the MEP Design Lead for the DNR's Water System Improvement Project. Mr. Chancey is a proven engineer and project manager with over 20 years of broad planning, design, and management experience for municipal, federal, and other large installation projects. Most recently, he has been involved in projects ranging from the Mountaineer Medical Office Complex to the City of Bridgeport Water Booster Station Emergency Power Project. Mr. Chancey brings recent relevant experience managing several new construction projects and understands the complexity of successfully managing challenging sites, unique building configurations, and a large multidisciplined team. As the MEP lead, Mr. Chancey will collaborate closely with the project team to develop a design that embraces operational integrity and efficiency.

Detailed resumes for these team members follow.

ORGANIZATIONAL CHART



: Skelly and Loy, Inc. : Allegheny Design Services : Triad Engineering, Inc. D.F. Staley

*: Resume Attached

Organizational Chart

STEPHEN R. MORSE, P.E., Senior Environmental Engineer

EDUCATION:
M.S., Environmental Engineering, 1985

B.S., Civil Engineering, 1978

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:
Professional Engineer, PA, NJ, DE, MD, VA

OSHA Excavation Competent Person

OSHA HAZWOPER

YEARS OF EXPERIENCE:
35 Years

Mr. Morse has more than 35 years of experience in environmental, civil, and construction projects. This experience has been gained through involvement in the planning, process design, preliminary design, detailed design, and construction supervision and management for numerous engineering projects. Mr. Morse has managed and/or provided technical input on water reuse, surface water quality, potable water, domestic and industrial wastewater, soil and groundwater remediation, solid and hazardous waste and materials management, and land development projects.

PROFESSIONAL EXPERIENCE

Potable Water Systems Engineering - Mr. Morse has provided ongoing potable water system engineering consulting for numerous existing municipal and privately owned public water systems. Services performed include operations consulting, infrastructure management/capital improvement plan preparation, capacity expansion (source, treatment, distribution, and storage) evaluations, budget and user rate evaluations, permit renewals, evaluation of impacts due to new regulatory requirements, and design of new facilities or modification to the system infrastructure.

Mr. Morse has also developed new sources and designed new systems for existing areas and new developments not currently served by a public water system. These services include identification of potential sources, evaluation of the source options, testing of the selected source, Public Water Supply permit application preparation, and preparation of design drawings for the construction of source, treatment, distribution, and storage facilities.

Domestic Wastewater Design and Management - Mr. Morse has provided ongoing wastewater system engineering consulting for numerous existing municipal and privately owned permitted wastewater systems. Services performed include operations consulting, infrastructure management/capital improvement plan preparation, evaluation of collection system infiltration and inflow, capacity expansion (both collection and treatment) evaluations, budget and user rate evaluations, permit renewals, evaluation of impacts due to new regulatory requirements, and design of new facilities or modification to the system infrastructure.

Mr. Morse has also provided wastewater management consulting for environmentally sensitive areas. Wastewater regulations for areas with high concentrations of nitrate in the groundwater or that are designated as high quality or exceptional value watersheds typically restrict wastewater discharges. Mr. Morse has obtained approval for low impact wastewater systems in the sensitive areas. Systems approved and implemented include individual and community on-lot treatment and disposal, a zero discharge evapotranspiration greenhouse system, and spray irrigation systems. Services provided include management of site soil testing, planning document and permit application preparation, and design and implementation of the approved wastewater system.

Mr. Morse has also evaluated options and designed wastewater systems to serve new developments or existing neighborhoods that exist outside of an existing central wastewater service area. Services include on-site testing, option evaluation and selection, permit application preparation, and system design and implementation. Options approved include individual and community on-lot systems, spray irrigation systems, a greenhouse evapotranspiration system, and central treatment with stream discharge.

STEPHEN R. MORSE, P.E., Senior Environmental Engineer

Land Development Projects - Mr. Morse managed and provided technical input on several land development projects. Land development services performed were preparation of land development plans, meeting with township officials, requesting zoning variances, preparing stormwater management plans, developing wastewater treatment options, and preparing the erosion and sedimentation plans. Mr. Morse has also evaluated wastewater and potable water system options for proposed developments.

Industrial Wastewater and Waste Management - Mr. Morse has provided industrial wastewater services for many clients. Whether an industrial wastewater is discharged directly to surface waters or to a local POTW, effluent restrictions typically apply. Wastewater services to industries include the evaluation and testing of wastewater sources, identification and quantification of contaminants of concern and wastewater volumes, development of wastewater volume and load reduction strategies, design of treatment and pre-treatment systems, and implementation of the selected solution. Often, an evaluation of actual and potential wastewater surcharges versus the costs for implementing treatment systems is performed to help select the most cost-effective management solution. Contaminants of concern have included inorganic chemicals (often heavy metals), organic chemicals (often volatiles and solvents), and biochemical oxygen demand.

Mr. Morse has also performed required industrial waste reporting. Reporting of wastewater discharges, residual waste quantities, waste constituents, toxic reduction strategies, Tier II chemicals, and other waste reporting have been performed to comply with environmental and community right-to-know requirements. In addition, stormwater discharge reporting and inspections were performed and the related preparation of spill plans and hazardous substance survey forms was also performed. Where applicable, waste reduction strategies to save energy and costs were implemented.

Water Reuse - Mr. Morse managed and provided technical design for several water reuse projects. For stormwater reuse, Mr Morse is lead engineer on a county-wide rainwater harvesting project in Maryland. The project involves the design of systems to collect rainwater from the roofs of county-owned buildings and treating and storing the water for reuse for irrigation, fire protection water, and vehicle and equipment washing. The project not only reduces the amount of stormwater runoff to the sewers and streams, it also reduces potable water use for these activities. These designs also include automatic systems to collect washwater to prevent discharge to surface waters.

Mr. Morse has also been involved in the concept design of a large wastewater treatment system for a planned development located upstream of a high quality wetlands. The systems evaluated included nutrient removal with spray irrigation and/or rapid infiltration for disposal and gray water reuse for a significant portion of the wastewater.

Surface Water Quality - Mr. Morse has managed and provided technical input on the preparation of stormwater and wastewater discharge (NPDES) permit applications for more than 30 clients. Application preparation included review and compilation of historical discharge sampling results, sampling of existing outfalls, projection of future outfall parameter concentrations, completion of the application forms, and performance of public and municipal notifications.

Mr. Morse provided technical input and field data collection for the design of stream relocation/rehabilitation projects utilizing the Rosgen Fluvial Geomorphology Method. His designs included plans, profiles, sections, and numerous details and schedules to define the stream route, width, depth, and slope; the energy dissipating structures; and the fish and wildlife habitat structures.

Mr. Morse managed the development of an OPA-90 facility response plan for a large spill for a heating oil distributor located on the Delaware River as well as numerous spill response plans (PPC, SPCC, SPR) for various industrial, commercial, and institutional (schools and universities) clients. The plans included spill prevention and response planning and provided detailed instructions on location and types of oil collection devices required to contain spills and protect wildlife sensitive areas as well as instruction on the required downstream notifications.

Soil and Groundwater Remediation - Mr. Morse managed and/or provided technical input on the evaluation, process design, permit application preparation, and installation of more than 20 soil and groundwater treatment systems. Soil treatment systems evaluated were vapor extraction, steam injection, excavate and dispose, in-situ soil washing, soil incineration, and isolation. Groundwater treatment systems evaluated included carbon absorption, UV oxidation, packed tower aerators, low profile aerators, chemical precipitation, ion exchange, and oil/water separation. Designs included detailed plans and specifications for installation of wells, extraction equipment, piping, controls, sensors and other instruments, buildings, and treatment equipment.

STEPHEN R. MORSE, P.E., Senior Environmental Engineer

Mr. Morse managed a $3.1 million investigation and design project for the U.S. Air Force. The project included the design of renovations to an existing groundwater treatment and collection system, cut-off walls, collection trenches and pumping stations, and upgrades to the system controls. Soil remediation design included capping, excavation and disposal, and incineration. Detailed drawings, specifications, design reports, and operations and maintenance manuals were prepared for this design.

Stormwater Management - Mr. Morse has designed and implemented stormwater management systems for the control, treatment and reuse of stormwater. Project work has included the design of stormwater infrastructure for the conveyance of stormwater, stormwater retention basins for the peak discharge reduction, infiltration basins for the recharge of groundwater, treatment infrastructure for the removal of contaminants, and storage and treatment facilities for the re-use of stormwater for non-potable water purposes.

STEPHEN R. MORSE, P.E., Senior Environmental Engineer

MARK T. PITTERLE, Ph.D., P.E., Senior Engineer/Regional Director of Business Development

EDUCATION:
Ph.D., Civil Engineering, 2009, University of Colorado Denver

M.S., Environmental Engineering: Water & Wastewater Track, 2004, Virginia Tech

B.S., Earth Science: Minors in Geology & Geography, 2000, The Pennsylvania State University

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:
P.E., Ohio, Pennsylvania, Virginia

YEARS OF EXPERIENCE:
16 Years

Dr. Pitterle is a Civil and Environmental Engineer with over 10 years of experience in design, construction, and installation of energy and water treatment systems. He specializes in optimizing the long-term sustainability of urban and rural infrastructure, by improving efficiency, performance, and waste-to-value byproducts. He employs proven life cycle project optimization that reduces operating costs and minimizes environmental impacts. Core competencies include:

- Project and Business Management
- Proposal and Technical Writing
- Client Retention
- Plant Optimization
- Research and Development
- Water and Wastewater
- Water and Energy Efficiency
- Waste Management
- Sustainability
- Fate and Transport
- Risk Assessment
- Waste Byproducts
- Life Cycle Assessment
- Greenhouse Gas Accounting

PROFESSIONAL EXPERIENCE

Regional Director of Business Development & Senior Engineer, Skelly and Loy (www.skellyloy.com), 2015-Present- Lead engineering service group & regional business development in western PA, OH, and WV.

- Lead regional business development for all service offerings of the Morgantown and Pittsburgh offices.
- Expand existing engineering service group projects in water, wastewater, stormwater, energy/water efficiency, remediation, sustainability, greenhouse gas inventories, life cycle assessment
- Integrate client needs into engineering projects and oversee technical review of engineering proposals, projects, designs, and reports

Executive Director & Board Member, iCATIS, Ligonier, Pennsylvania, 2008 – 2015 - Coordinate all iCATIS consulting, proposal submission, and research and development. Lead design and installation of water and energy infrastructure and site master plans in Mexico, Haiti, and the U.S.

- Expanded clients by 100% & created multiple collaborative partnerships with universities and governments
- Established ceramic water filter system product manufacturing & sales business in U.S.
- Lead Navajo Nation expert Water Science Team developing low cost, water treatment infrastructure
- Coordinated research with New Mexico State University to develop a filter to remove uranium from drinking water for the Navajo Nation
- Internationally, led renewable energy installation projects in both India and Sri Lanka, including leading a 10-day workshop where Mark taught participants to make reliable home-made windmills from scratch.
- Project lead for a wide range of appropriate technology installations including construction and installation of vertical and horizontal axis

wind turbines, anaerobic digesters, alcohol fuel stills, wood gasifiers, water and wastewater treatment systems, and other waste-to-energy technologies.

Owner and Director of Operations, NSEG, Arvada, Colorado, 2012 – 2013 -Led all business finances, logistics, site design, O&M, and contracting for engineered products and consulting.

- Assisted with U.S.P.T.O non-provisional utility patent submission for our water treatment technology
- Led installations of three pilot water and wastewater treatment plants at the UN Haiti Stabilization Mission
- Sustainability advisor to the UN's Director of Mission Support in Haiti: Site visits to 10 bases
- Developed life cycle comparison metrics for Boulder, CO wastewater denitrification capital improvements

Owner and Director of Water Services, Symbiotic Engineering, Boulder, Colorado, 2009 – 2012 - Led water, wastewater, and solid waste consulting services at Symbiotic Engineering.

- Developed risk assessment, efficiency, rebate, GHG, and capital improvement models for cities & utilities
- Built start-up to ultimate sale of our utility information management software tool
- Oversaw and retained multi-year contracts with 6 water utilities including Anaheim, CA & Fort Collins, CO
- Assisted coordination of technical services and client development that exceeded $120,000/month
- Advised development of Symbiotic's Sustainability Information Management System (SIMS) utility software tool
- Developed complex mathematical models for evaluating weather normalization and heating/cooling loads city-wide using utility data in partnership with the National Renewable Energy Lab
- Developed water normalization, indoor/outdoor water use, and irrigation per square foot of turf models city-wide using utility data
- Project Manager for a SIMS deployment with Anaheim Public Utilities, advising cost-effective, sustainable energy and water utility improvements, while reporting the effectiveness of existing efficiency and conservation programs
- Project Manager for the City of Longmont, CO's electricity and water utility SIMS deployment, while also quantifying indoor and outdoor water use and intensities (e.g., gal indoor/ft2 building, gal irrigation/ft2 turf) and weather normalized outdoor use city-wide on a per parcel basis
- Colorado River Water Efficiency Collaborative forming group member, which is a collaborative across all seven basin states to benchmark and assist water efficiency planning and implementation
- Project Manager for city-wide Scope 1&2 GHG inventories including electricity, natural gas, transportation, water and wastewater treatment, and solid waste management.
- Project Manager for water treatment plant (WTP), wastewater treatment plant (WWTP), and solid waste facility energy use and GHG inventory quantification

Adjunct Faculty and Research Fellow, University of Colorado Denver, Denver, Colorado, 2004 – 2009 - Instruction, laboratory analytics, laboratory health and safety assistant, and sustainability assessments of water and wastewater treatment plants: capital improvement projects, regulatory compliance, water and energy use, waste byproducts.

- Instructed a master's civil engineering course, CE 5504: Introduction to Environmental Engineering
- Energy, economic, GHG and infrastructure sustainability life cycle assessment (LCA) for ten Front Range, CO WTPs, WWTPs and water recycling plants detailing cost-effective asset management, energy efficiency, water conservation, and GHG mitigation strategies.
- Developed 5 year payback solutions for six Colorado wastewater treatment plants with >25% energy savings
- Assistant lead for laboratory environmental health and safety development and equipment purchasing
- Conducted waste food, paper, biodegradable plastic anaerobic digester optimization tests
- Project lead for wind renewable energy installation and training project in India
- Project assistant for solar renewable energy installation project in Sri Lanka
- Created and led student engineering group that won the 2005 EPA's P3 Student Design Competition

Research Assistant, Virginia Tech, 2001-2004

- Led field assessment, environmental compliance, and risk assessment for creosote contaminated site sampling and analysis using hybrid poplar phytoremediation
- Developed experimental sampling procedure, conducted all water quality analysis, analyzed plume shrinkage for environmental compliance
- Developed a new test (Pitterle et al., 2005) to evaluate in-situ field phytoremediation degradation rates
- Lab equipment experience using IC, GC, GC-MS, soil extractions, gas sampling, pathogens, general water and wastewater quality testing

RELEVANT TRAINING

ArcGIS
AutoCAD
SimaPro, TEAM LCA Software
GHG Accounting: GHG Protocol, ISO 14064/14065, The Climate Registry, US EPA's GHG Reporting
Macro, Model Development
Laboratory analysis: water, wastewater, soil, & gas

PROFESSIONAL AFFILIATIONS

iCATIS 501c3 non-profit Board Member

PUBLICATIONS

Rogowski, S.; M. Pitterle; A. Ramaswami; D. Kuchenrither. 2010. Denver Metro District: Quantifying Energy and Greenhouse Gas Mitigation Opportunities for Biosolids Treatment Alternatives. Water Environment Federation Residuals and Biosolids 2010 Conference.

Pitterle, M.T. 2009. Evaluating and Enhancing Urban Wastewater System Sustainability. Ph.D. Dissertation: University of Colorado Denver.

Pitterle, M; A. Ramaswami. 2005. Urban Sustainable Infrastructure Engineering Project (USIEP): Urban Water Solutions. Paper accepted for oral presentation at Engineering Sustainability 2005, Mascaro Sustainability Conference, Pittsburgh, Pennsylvania, April 10-12, 2005.

Pitterle, M.T.; R.G. Andersen; J.T. Novak; M.A. Widdowson. 2005. Push-Pull Tests to Quantify In Situ Degradation Rates at a Phytoremediation Site. Environmental Science and Technology: 39 (23), 9317-9323.

Pitterle, M.T. 2004. Push-pull tests to quantify in-situ naphthalene phytoremediation rates. M.S. Thesis: Virginia Polytechnic Institute and State University.

HONORS AND AWARDS

U.S. EPA "P3" 2005 University of Colorado Denver Student Design Project Team Award Winner – Sustainable

Energy Systems Design for a Tribal Village in India

Ph.D. fellowship at University of Colorado Denver: 2004-2009

Full TA/RA position at Virginia Tech: 2001-2003

Virginia Tech Chi Epsilon honors society member

Dean's list at Virginia Tech Fall 1996, Spring 2002 and at Penn State University: Spring 1998, Fall 1998, Spring 1999, Fall 1999, Spring 2000

National Society of Collegiate Scholars and Golden Key National Honors Society member

Ellis Drake Scholarship – One year partial tuition: 1999

MICHAEL E. LOWER, P.E., Environmental/Chemical Engineer

EDUCATION:
B.S., Chemical Engineering, 1996, The Pennsylvania State University

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:
Professional Engineer, PA, MD

RELEVANT TRAINING:
Rosgen Level I, "Applied Fluvial Geomorphology" short course, Wildland Hydrology, Pagosa Springs, Colorado, February 2003

Rosgen Level II, "River Morphology and Applications" short course, Wildland Hydrology, Pagosa Springs, Colorado, August 2003

Rosgen Level III, "River Assessment and Monitoring", Lubrecht Forest, August 2004

Rosgen Level IV, "River Restoration and Natural Channel Design", Elkin, North Carolina, April 2005

YEARS OF EXPERIENCE:
19 Years

As a Chemical Engineer, Mr. Lower concentrates on designing wastewater and potable water treatment solutions for industrial, municipal, and residential clients. As a result, his project experience encompasses a broad range of treatment systems both in size and complexity. On such engineering projects, Mr. Lower has determined the physical, biological, and chemical characteristics of the influent including flow rates and constituents concentrations. His responsibilities have included evaluating flow data in regard to hydraulics, effluent requirements, mass loading and solids balance, environmental constraints, equipment availability, O&M and construction costs, and personnel and energy requirements.

He has completed design plans and specifications, which included process flow diagrams and design criteria, piping and instrumentation diagrams, and plan layout. In addition to designing new systems, Mr. Lower has increased efficiencies, corrected malfunctions, and retrofitted existing systems with new technologies.

PROFESSIONAL EXPERIENCE

Potable Water Systems

St. Martin's Bridge, Philadelphia, Pennsylvania - Mr. Lower was the staff engineer responsible for design of this project involving a new 100-foot span pedestrian bridge over Cresheim Creek which also supports a sanitary sewer pipeline, relocation of a potable water line routed underneath the stream channel and protected with cross rock vane grade control structures, and hydraulic analysis of the new bridge opening to model the reduced 100- and 500-year flood elevations that resulted from the increased hydraulic opening of the new bridge which replaced a deteriorating stone arch bridge.

Caron Foundation, Wernersville, Pennsylvania - Designed the connection system and pumps to connect additional water sources to the existing potable water system at this site. Design drawings and specifications were prepared for the connection of two additional wells to the existing potable water system. An upgrade of the chlorine injection system and the controls for the potable water system were also included in this design.

Getty Property Corp., Intercourse, Pennsylvania - Prepared three transient noncommunity public water supply permit applications for the installation of activated carbon units to remove methyl tertiary butyl ether (MTBE) from potable water sources at two small restaurants and a convenience store in the village of Intercourse. An investigation of the existing systems was performed, system sketches were prepared, and drawings and specifications concerning the proposed treatment systems were prepared. Meetings with PA DEP were conducted to assure that the provided systems would meet regulatory requirements.

Orbisonia-Rockhill Joint Municipal Authority (ORJMA), Orbisonia, Pennsylvania - Skelly and Loy is the consulting engineer for ORJMA for its potable water system and provides engineering as needed and requested by the authority. To date, Skelly and Loy has evaluated the connection of an existing well to the ORJMA system, piping and pumps at the existing well, capacity of the existing well and pumps, storage tank level sensor and well pump control replacement, distribution system water conveyance and leakage problems, and well pump emergency power issues. A capital improvements plan has been developed and the cost of connected an alternate well source was evaluated. Skelly and Loy also provided budget assistance and rate evaluation.

Pennsylvania State University, Mont Alto Campus, Mont Alto, Pennsylvania - Skelly and Loy evaluated, performed design, and prepared construction bid documents for various upgrades to the existing potable water system at this site. Upgrades included replacement of an existing altitude valve, installation of bypass piping around the existing altitude valve, replacement of chlorine feed piping, and relocation of a flow meter and readout. In addition, Skelly and Loy evaluated the water storage and distribution system and recommended piping changes to increase water turnover in the stand pipe and to assist flow through the distribution system.

Municipal Wastewater Systems

Orbisonia-Rockhill Joint Municipal Authority - Providing general municipal engineering services to this joint water/wastewater authority, which encompasses two Boroughs and one Township.

Eagle Creek, Centre County, Pennsylvania - For this 104-unit mobile home park, completed design and permit application for a wastewater treatment system with stream discharge.

Grampa's Woods, Pike County, Pennsylvania - To serve this planned retirement community, currently engineering a wastewater treatment system.

Industrial Wastewater Systems

Allied Tube and Conduit, City of Philadelphia, Philadelphia County, Pennsylvania - As Project Manager and Engineer, prepared biannual discharge reports for four outfall locations throughout the industrial manufacturing site. Supervised all sample collection, laboratory analysis, and data collection and provided a quality report detailing conditions observed at this site. Provided recommendations and suggested improvements as necessary.

Quebecor Printing, Fairfield Borough, Adams County, Pennsylvania - As Project Engineer, provided hands-on evaluation of industrial processes to determine wastewater produced at the plant. Tasks included reviewing MSDS sheets, inspecting all processes, evaluating operations, and analyzing wastewater characteristics. A comprehensive report was generated, recommending improvements and suggesting modifications to the operation of the facility.

Flinchbaugh Engineering, Inc., Wastewater Treatment, York County, Pennsylvania - As Project Engineer, conducted a system analysis and review. Industrial waste permitting with the local sewer authority, operations review, site inspection, and correction alternatives analysis were also performed.

TTT Realty, East Greenville, Montgomery County, Pennsylvania - As Project Engineer, performed hands-on evaluation of food process waste stream for contaminant removal along with wastewater treatment operations personnel. The evaluation tasks included reviewing laboratory analytical data and chemical treatment processes. Design of a chemical feed system was also performed.

PP&L, Northampton County, Pennsylvania - For this electrical utility, designed a small-flow wastewater treatment system which included a sewage pumping station.

HF Campbell, Perry County, Pennsylvania - Completed a background design for a washwater recirculation system. Components included two holding tanks, storage tanks, and a pumping station.

Hershey Foods Corporation, Hershey, Pennsylvania - Designed a complex piping system to install flow meters in an existing metering chamber for this chocolate and candy manufacturer.

Park's Garbage Service, Huntingdon County, Pennsylvania - Prior to construction of this waste transfer facility, designed a wastewater collection line with connection to the municipal sewer.

TJ's, Inc., Liverpool, Pennsylvania - Engineered a small-flow sewage treatment system for this restaurant.

Acid Mine Drainage

Freshwater Institute, Allegany County, Maryland - Contributed to the engineering design as well as provided construction inspection services for an acid mine drainage treatment system.

DANIEL R. AUNGST, P.E., Environmental Engineer

EDUCATION:
B.S., Environmental Engineering, 2001, The Pennsylvania State University

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:
Professional Engineer, PA

RELEVANT TRAINING:
Rosgen Level I, "Applied Fluvial Geomorphology" Short Course, Asheville, NC, February 2004

Rosgen Level II, "River Morphology and Applications" Training, In-House Training at Skelly and Loy, Inc.

Rosgen Level III, "River Assessment and Monitoring" Training, In-House Training at Skelly and Loy, Inc.

Rosgen Level IV, "River Restoration and Natural Channel Design" Training, In-House Training at Skelly and Loy, Inc.

PUBLICATIONS
"Stormwater Attenuation and Gully Repair in Carpenters Woods, Wissahickon Valley Park, Philadelphia," Moses, T., Aungst, D., and Longenecker, G., *AWRA Annual Conference*, November 1-4, 2010, Philadelphia, Pennsylvania.

YEARS OF EXPERIENCE:
15 Years

Mr. Aungst has more than 15 years of experience in environmental, civil, and construction projects. This experience has been gained through involvement in the planning, process design, preliminary design, detailed design, permitting, and construction phases of numerous engineering projects. Mr. Aungst has managed and/or provided technical input on wastewater, potable water, soil and groundwater remediation, stormwater management and surface water quality, solid and hazardous waste and materials management, stream and ecosystem restoration, and land development projects. During the design phase of these projects, Mr. Aungst utilizes his "hands-on" construction experience to provide value engineering services in order to develop pragmatic solutions and cost-savings alternatives. Mr. Aungst also provides construction oversight and technical support in the field during the implementation phase of these projects.

PROFESSIONAL EXPERIENCE

Wastewater Design and Management - Managed and/or provided technical input during the evaluation, planning, design, permitting, and construction phases of numerous wastewater treatment projects. These systems have ranged from residential systems to package treatment systems to large cast-in-place municipal treatment systems. Evaluated treatment options and costs for new systems, along with upgrades to existing systems. Designed and permitted numerous on-lot subsurface sewage disposal systems for residential and commercial applications in accordance with local and state guidelines. Designed and permitted numerous package treatment systems to serve residential developments, utilities, commercial establishments, recreational facilities, and small municipalities. Utilized various effluent disposal methods in conjunction with these package treatment systems, including drip irrigation, spray irrigation, stream discharge, on-site subsurface disposal, and discharge to evapotranspiration greenhouses. Designed and prepared permit applications for numerous upgrades to existing wastewater collection systems, pump stations, force mains, and treatment systems. Designed and permitted numerous collection and conveyance facilities to serve new land development projects. For all of these projects, the required sewage planning modules and permit applications were prepared and submitted to the appropriate regulatory agency for approval.

Evaluated infiltration and inflow impacts within an existing municipal wastewater collection system and developed a hydraulic monitoring plan to help to locate leaks and problem areas. Evaluated commercial discharge concentrations within an existing municipal wastewater collection system and developed an organic sampling plan and wastewater ordinance. Managed and/or provided technical input on the evaluation and design of several high-strength food service wastewater pretreatment systems. These treatment systems have ranged from solids, oil, and grease removal to aerobic treatment with chemical addition. Provided technical input for numerous industrial wastewater treatment system process designs. These systems were designed to remove copper, volatile organic chemicals, and BOD.

Potable Water Systems Engineering - Provided technical input for numerous potable water treatment system design projects. Projects have ranged from preparation of design plans and technical specifications for the construction of new water mains to minor modifications and upgrades to existing treatment systems serving small communities to large multi-source community water supplies. For these projects, potable water permit applications were prepared and permits were issued by the state regulatory agency. Engineering bid packages were prepared to publicly bid construction of the water systems.

Designed and permitted multiple potable water treatment systems including a filtration system for a potable water supply under the influence of surface water, an activated carbon treatment system for the removal of methyl tertiary butyl ether from an existing potable water supply, a filtration system for the control of manganese from an existing potable water supply, and a filtration system for the removal of arsenic from an existing potable water supply (in order to meet new regulatory standards). Designed and permitted upgrades to an existing treatment facility for the removal of nitrates from the potable water supply in order to meet regulatory standards. This project also required the design and installation of water softening equipment prior to treatment. Designed and permitted a new community water system consisting of multiple supply wells, well pumps and controls, distribution piping and appurtenances, treatment and monitoring equipment, finished water storage tank, and system controls. Evaluated and designed miscellaneous upgrades for numerous water sources, well piping systems, storage tanks, treatment systems, and distribution systems.

Performed water quality sampling, prepared annual Consumer Confidence Reports, prepared monthly and annual Water Quality Reports, provided annual budget assistance and rate evaluation, and conducted numerous well and water system inspections.

Construction - Mr. Aungst manages Skelly and Loy's in-house construction team during the implementation phase of numerous potable water, wastewater, stormwater, and environmental construction projects, many of which have been completed utilizing a design/build approach. In addition to overseeing on-site construction personnel and contracts/budgets, Mr. Aungst provides on-site engineering oversight, regulatory and landowner coordination, and technical assistance during construction of these projects.

Stormwater Management and Permitting - Prepared erosion and sediment control (E&SC) plans and NPDES stormwater permit applications for numerous stormwater, utility protection, and stream restoration projects. Managed and/or provided technical input on the preparation or renewal of NPDES discharge permit applications for numerous wastewater and stormwater projects.

Land Development Projects - Provided technical input on several land development projects including preparation of grading plans, coordination with township officials, requesting zoning variances, preparing stormwater management plans, developing wastewater treatment options, and preparing E&SC plans. Performed miles of land surveying for construction grade stakeouts, property boundaries, stream restoration projects, utility locations, and permanent structures. Provided construction oversight and inspection services for various wastewater, stormwater, and land development projects.

Stream Restoration and Watershed Assessment - Conducted numerous watershed-wide assessments and site-specific evaluations in order to identify and prioritize impaired stream reaches and sediment and/or pollution sources. Provided technical input utilizing fluvial geomorphic design principles on numerous stream restoration and relocation projects designed to create flood storage, reduce bank erosion, protect existing utilities (buried and overhead) and other infrastructure, and improve aquatic habitat in both rural and urban settings. Performed extensive field survey and data collection work contributing to the development of profiles, cross sections, and topographic plans for these projects. Provided technical input for the design and permitting of channel reconstructions, in-stream grade-control and habitat structures, utility crossings, and streambank stabilization features. Provided construction oversight and inspection services during construction of these projects, along with as-built surveying and post-construction monitoring.

Environmental Remediation - Provided technical input on the evaluation, process design, permit application preparation, and installation of several soil and groundwater treatment systems. Designs included detailed plans and specifications for installation of dewatering wells, monitoring wells, air injection equipment, extraction equipment, conveyance piping, process controls, and other treatment equipment. Developed detailed plans and specifications for the removal of contaminated soils, dismantling of an industrial waste treatment facility, decommissioning of numerous industrial waste sumps, and upgrade of existing underground storage tank systems.

DANIEL R. AUNGST, P.E., Environmental Engineer

LUKE E. SMELTZ, CPSS, Soil Scientist/Project Manager

EDUCATION:
B.S., Agronomy, 1987, The Pennsylvania State University

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:
ARCPACS Certified Professional Soil Scientist (CPSS), [redacted]

PA DEP Certified Sewage Enforcement Officer (SEO), #1958

OSHA 1910.120 HAZWOPER Trained (40-Hour) with Annual 8-Hour Refreshers

Troxler Certified Nuclear Testing Gauge Operator

YEARS OF EXPERIENCE:
29 Years

Mr. Smeltz has over 28 years of experience investigating soils and making interpretations for on-site wastewater and solid waste disposal, wetlands delineations, Phase I cultural resources investigations, stormwater management, beneficial land application of wastes and biosolids, and environmental site characterization and remediation.

PROFESSIONAL EXPERIENCE

Mr. Smeltz has performed field investigations, often as principal investigator, on numerous soils and site evaluation projects, identifying and mapping the soils and making interpretations for various on-site uses and natural resource delineations. He has extensive experience in performing site evaluations for on-site wastewater disposal systems including test pit soil profile descriptions, soil morphology interpretations, and percolation and permeability testing for both large community systems and individual residential systems. Site evaluations have been completed to identify and quantify soil resources for both municipal and residual waste disposal facilities including soils mapping using National Cooperative Soil Survey (NCSS) procedures, detailed soil profile descriptions using United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) procedures, and soil sampling for laboratory physical and chemical analyses. Wetlands delineations have been performed for solid waste disposal facilities, utility companies, proposed U.S. Postal Service sites, municipal wellhead protection areas, and other commercial and residential land development projects using United States Army Corps of Engineers (USACE) procedures. He has completed soils and geomorphology interpretations for Phase 1 cultural resources investigations on several project sites related to floodplain stormwater management and highway construction. Mr. Smeltz has also completed site evaluations to identify prime farmland areas and has evaluated sites for the application of beneficial use materials such as food processing wastes, wastewater, and biosolids.

Mr. Smeltz also has substantial project experience in performing site characterizations; soil, water, and air monitoring and sampling; and remediation of sites impacted by petroleum hydrocarbons, volatile organic compounds, and heavy metals. These projects were at industrial sites including manufacturing and refinery facilities and at military installations and major airports. He has logged and sampled soil borings and monitoring well installations using various drilling methods. He has performed oversight of soil remediation/excavation projects and completed detailed confirmation sampling to document attainment of remediation standards while also supervising remediation subcontractors. He has performed groundwater monitoring and sampling and also soil vapor extraction system monitoring and sampling and is qualified in the use of various field analytical equipment including organic vapor analyzers, petroleum hydrocarbon analyzers, and water quality monitoring equipment. He has also performed data analysis and assisted with site closure reporting for numerous sites in Pennsylvania under the Act 2 Land Recycling Program.

PROFESSIONAL AFFILIATIONS

Pennsylvania Association of Professional Soil Scientists
American Society of Agronomy/Soil Science Society of America

RELEVANT TRAINING

***Hazardous Waste Operations and Emergency Response Refresher, Mine Safety Refresher, First Aid and CPR*:** Eichelberger's Safety Consulting Services, March 18, 2011

***Troubleshooting On-Lot Systems*: PA DEP SEO Training Course #214, PSATS Training Center, Enola, Pennsylvania** - Gordon Sheetz, Instructor; January 21, 2009

***Hazardous Waste Operations and Emergency Response Refresher and Mine Safety Refresher*:** Eichelberger's Safety Consulting Services, February 25, 2008

***Site Testing and Evaluation*: PA DEP SEO Training Course #211, Harrisburg, Pennsylvania** - Mark Mills and Gordon Sheetz, Instructors; May 31 and June 1, 2007

***First Aid, CPR, Bloodborne Pathogens*:** Eichelberger's Safety Consulting Services, April 19, 2007

***OSHA HAZWOPER 8-Hour Refresher Course*: SAIC,** Christopher Fontana, March 20, 2007

***Alternate Peat-Based Systems*: PA DEP SEO Web-Based Training Course #332,** March 16, 2006

***Hazardous Waste Operations 8-Hour Supervisor Training (OSHA 1910.120):* SAIC Online Self-Study Course, evaluated by** Michael Crenshaw, March 4, 2005

***Construction Inspection Techniques*: PA DEP SEO Training Course #206, PSATS Training Center, Enola, Pennsylvania** - Gordon Sheetz, Instructor; February 16, 2005

***Soil Testing and Characterization for Stormwater Infiltration:* Pennsylvania Association of Professional Soil Scientists Technical Session, Harrisburg, Pennsylvania -** Randy Greer, Delaware DNR; Thomas Cahill, Cahill Assoc.; Daniel Fritton, Ph.D., Penn State University; Edward White, CPSSc, PA State Soil Scientist; July 21, 2004

***Alternate Steep Slope Elevated Sand Mound On-Lot Sewage Disposal Systems*: PA DEP SEO Web-Based Training Course #328,** November 20, 2003

***Alternate At-Grade On-Lot Sewage Disposal Systems*: PA DEP SEO Web-Based Training Course #329,** July 25, 2002

***Alternate Drip Dispersion On-Lot Sewage Disposal Systems*: PA DEP SEO Web-Based Training Course #321,** July 25, 2002

***Siting New On-Lot Sewage Treatment Systems by Assessing Infiltration Loading and Hydraulic Linear Loading Utilizing Soil Morphology:* Pennsylvania Association of Professional Soil Scientists Technical Session, Harrisburg, Pennsylvania -** Darrell Fritz, CPSSc, and William Davis, PA DEP; Joseph Valentine, CPSSc; Jerry Tyler, Ph.D., University of Wisconsin; January 9, 2002

***Advanced Soils Training for SEOs*: PA DEP SEO Training Course #109, Beltzville State Park, Jim Thorpe, Pennsylvania** - Mark Mills and Jason Fellon, Instructors; September 21, 2001

***Drip Irrigation*: PA DEP SEO Training Course #312, Harrisburg, PA** - Mark Mills and Gordon Sheetz, Instructors; March 14, 2000
***Site Selection and Requirements for Drip Irrigation in PA:* Pennsylvania Association of Professional Soil Scientists Technical Session, SAIC Learning Center of Applied Environmental Technology, Middletown, Pennsylvania** - Thomas Ashton, CPSSc, American Manufacturing; Joseph Valentine, CPSSc; Edward White, CPSSc, PA State Soil Scientist; May 18, 1999

***Permitting of Alternate and Experimental Systems*: PA DEP SEO Training Course #108, Harrisburg, Pennsylvania** - Mark Mills, CPSSc, and Gordon Sheetz, SEO, Instructors; March 3, 1999
***Winter Wetlands Identification*: SAIC Learning Center of Applied Environmental Technology, Middletown, Pennsylvania** - Robert Hill, PA DEP Wetlands Botanist, Instructor; January 27-28, 1997

***Permitting of Individual Residential Spray Irrigation Systems*: PA DEP SEO Training Course #303, Harrisburg, Pennsylvania** - Mark Mills, CPSSc, and Gordon Sheetz, SEO, Instructors; June 11, 1996

***Soil and Water Relationships:* Pennsylvania Association of Professional Soil Scientists Technical Session, Hershey, Pennsylvania** - Jay Lehr, Environmental Education Ent., Inc.; Mallory N. Gilbert, CPSSc; Mike J. Vepraskas, North Carolina State University; Maurice J. Mausbach, USDA-NRCS; H. Chris Smith, USDA-NRCS NTCHS; June 9-10, 1995

***Competent Person Training in Excavation Safety (OSHA 1926, Subpart P):* R. E. Wright Environmental, Inc., Learning Center of Applied Environmental Technology,** February 18, 1995

***Federal Regulations for Biosolids:* The Water Pollution Control Association of PA.,** March 30, 1993

***PA Sewage Enforcement Officer Certification No. 01958:* Pennsylvania Department of Environmental Resources (PA DER), Board for Certification of Sewage Enforcement Officers,** September 24, 1987

***Hazardous Waste Operations 40-Hour Health and Safety Training (OSHA 1910.120):* Phoenix Safety Associates, Ltd., R. E. Wright Environmental, Inc., Learning Center of Applied Environmental Technology,** September 18, 1987

D.F. Staley — Independent Contractor
P.O. Box 552
Romney, WV 26757
Mobile: 304-813-5225

EDUCATION
US Naval Electrical School;
US Naval Electrical/Mechnical Engineering School;
Potomac Service Schools – Electronics;
Borg Warner Institute – Duct Design and Air Distribution;
Potomac State College of WV University – Department of Engineering, Mechanical;
Various York and Rheem – Schools in Heating, Air Conditioning, and Refrigeration;
GE School of Lighting Design

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS
Electrical Certified Master
Asbestos Inspection Certification

YEARS OF EXPERIENCE
40 Years

PROJECT EXPERIENCE

Provided design, inspection, project representative, and surveys assistance services to L. Robert Kimball and Associates of Ebensburg, Pennsylvania.

Provided field inspection services and site engineering for BCM Engineers of Pittsburgh, PA on a five million dollar water treatment facility. During this period, served as a design engineer for a river water line crossing in the state of Pennsylvania and a water line roadway design.

Worked as an independent agent doing design and build work.

Performed field inspection for BCM Engineers of Washington, DC on an eleven million dollar waste treatment facility.

Owner and administrator of a construction and engineering firm. The main scope of jobs was as follows: building complexes, airport hangers, and design of electrical and mechanical system.

Worked as an area manager for a large electrical contractor specializing in overhead line building, highway lighting, and signal work. Duties consisted of directing a project management team, pay estimates, negotiate change orders, and served an EEO officer.

Worked as an independent agent having designed and supervised the building of a steel structure complete with electrical and mechanical systems for a power generating plant.

Co-owned electrical and mechanical contracting business. Was responsible for the design of both electrical and HVAC systems and served as field engineer.

Owner and administrator of an electrical and mechanical contracting business. The main scope of jobs was commercial and industrial wastewater treatment facilities, building complexes for State Highway, US Army, etc.

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Worked for electrical and mechanical contracting company as an electrician and HVAC mechanic.

Utility Projects

Cranberry Township, Butler County, Pennsylvania - Served as Resident Project Representative for a project in which a new two (2) story pumping station facility consisting of an 18-inch ductile iron pipe supply, and all internal piping and controls. The supply pumps are 200 HP pumps with variable frequency drive units.

City of Siserville, West Virginia - Served as Resident Project Representative for the installation of a 500,000 gallon steel water tank and approximately 7,000 feet of water line.

Hancock County Public Service District's Johnsonville and New Cumberland Heights, West Virginia - Construction Inspector which consisted of inspecting approximately 20,000 feet of sanitary sewer line.

Hancock County Public Service District's Route 2 Sanitary Sewer Relocation, Hancock County, West Virginia - Construction Inspector which consisted of inspecting approximately 3,000 feet of sanitary sewer line and forcemain that was relocated due to the widening of Route 2 from two lanes to three lanes.

Confluence Borough Municipal Authority, Confluence, Pennsylvania - Provided field inspection and site engineering for this new water system project. This project involved replacing approximately 20,000 feet of waterline, improving the existing surface water source and treatment plant, providing an additional groundwater source and treatment plant, upgrading the existing storage tank, providing an additional 350,000 gallon water tower, replacing approximately 300 water meters, dredging the existing reservoir, replacing the stream crossings and river crossing, and repairing the existing dam.

Keystone Renewable Energy, LLC., Greensburg, Pennsylvania - Provided field inspection and site engineering for the leachate collection force main outside the limits of Laurel Highlands Landfill.

Cambria Township Sewer Authority, Colver, Cambria County, Pennsylvania - Provided field inspection and documentation for the construction of the Colver Sewer Improvement Project and the conversion of the Colver WWTP to a sequencing batch reactor (SBR) treatment technology. The plant was expanded from 150,000 gpd to 275,000 gpd flow capacity. Assisted with shop drawing reviews, measured quantities, reviewed pay estimates and performed acceptance reviews.

Erma Street Pumping Station, White Township, Pennsylvania - Provided construction inspection. The Erma Street Pumping Station was constructed in 1979 by the Township to provide service to a housing development that was unable to be completely connected to the Township sewerage system by gravity sewers. This pumping station was a fiberglass, pre-engineered unit which pumped approximately 4,000 gallons per day. A newly design and installed station pumped 45,000 gallons per day.

Indian Springs Interceptor Project, White Township, Pennsylvania - Assisted with initial survey work, capacity evaluation, specification preparation, and interim construction inspection. Listed

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recommendations corrections and/or replacements (with cost estimates) to increase the capacity to its peak value.

City of Ebensburg, Pennsylvania - Provided inspection services for the upgrade of a wastewater treatment plant.

Hancock County Public Service District, Hancock County, West Virginia - Served as a Resident Project Representative and Inspector for a new wastewater treatment plant.

Numerous Project in which he served as a Survey Assistant on topographic, boundary, and ALTA surveys as well as construction stake-outs.

Worked on various projects where he inspected concrete pours for large structures.

Bradley A Reynolds, PE
Senior Geotechnical Engineer

PROFESSIONAL EXPERIENCE
20 Years

EDUCATION
BS, Civil Engineering, West Virginia University, Morgantown, WV

HIGHLIGHTS OF EXPERIENCE
Mr. Reynolds is currently the Regional Manager of Triad and Regional Geotechnical and Lab Practice Leader for the Eastern Region of Triad Engineering, Inc. Besides managing all phases of operations for the Eastern Region, Mr. Reynolds is responsible for management and planning of civil engineering design projects, construction monitoring and testing operations, geotechnical investigation projects, and soils and concrete laboratory work in the region. Specific experience has included projects for earth and concrete embankments, multi-story buildings, single story industrial warehouses and commercial buildings, large school projects, residential construction, structural evaluations, detention facilities, and numerous landfill investigations and construction.

REGISTRATIONS, LICENSES & TRAINING
Registered Professional Engineer, West Virginia, Virginia Maryland, Pennsylvania

Relevant Project Experience

Water Treatment Facilities

- New Oxford Water Treatment Facility Additions, *New Oxford, PA*
- West Pennsboro Waste Water Treatment Facility, *West Pennsboro, PA*
- Hagerstown Water Treatment Facility Expansion, *Hagerstown, MD*
- Conococheague Waste Water Treatment Facility Additions, *Washington County, MD*

Firefighting and Rescue Facilities
Principal and engineer in charge of geotechnical engineering, QA/QC inspection and testing services, and all laboratory services.

- East Germantown Volunteer Fire Station, *Germantown, MD*
- Hagerstown Airport Aircraft Rescue and Firefighting, *Hagerstown, MD*
- Waynesboro Fire Department, *Waynesboro, PA*
- National Fire Protection Training Facility, *Frederick, MD*

General Municipality Facilities
Provided Project Management and Engineering Services for numerous Municipal Facilities including schools, correctional facilities, treatment facilities, landfills, hospitals and roadways.

Correctional Facilities

- Housing Unit Expansion at Western Correctional Institute, *Allegany County, MD*
- Gatehouse Support Service at N. Branch Correctional Institution, *Allegany County, MD*
- Allegheny County Adult Correctional Facility, *Allegany County, MD*
- MCI Kitchen Addition, *Washington County, MD*
- New Adams County Adult Correctional Facility, *Adams County, PA*

Health Facilities

New Washington County Hospital, Washington County, MD

Principal and engineer in charge of performing geotechnical engineering services for the new Washington County Hospital. Field exploration included engineering analysis of multiple possible foundation systems based on the field results of over 50 test borings and 100 rock probes.

Roadways

Reichs Ford Road Reconstruction, Frederick County, MD

Project and Field Engineer for all services included drilling, laboratory testing and formulation of geotechnical design and construction recommendations for approximately 10,100 lineal feet of oadway reconstruction and widening. Pavement design was also performed for the roadway for support of traffic from the Frederick County Landfill and Transfer station.

David W. Hooper, PE

Geotechnical Engineering and QC Manager, Northern Region
Market Sector Leader, Energy Services

PROFESSIONAL EXPERIENCE
26 Years

HIGHLIGHTS OF EXPERIENCE
Mr. David Hooper brings more than 26 years of geotechnical engineering and project management experience to Triad Engineering, Inc., where he will lead engineering projects and business development activities for operations in Western Pennsylvania and Energy projects for all of Triad's Offices. Mr. Hooper's specialties include geotechnical engineering assessments and design for transportation, public works, energy, and other public and private projects, management of projects and staff personnel to ensure contractual, schedule and budgetary requirements, and client management, business and proposal development services to maintain and increase company client bases and promote firm diversity and growth.

EDUCATION

B.S., Civil Engineering	State University of New York at Buffalo, 1988

REGISTRATIONS, LICENSES & TRAINING

Registered Professional Engineer	West Virginia, Maryland, Pennsylvania, Ohio, New York

PROFESSIONAL ORGANIZATIONS / ASSOCIATIONS
American Society of Civil Engineers (ASCE)
ASCE Geo Institute
NAIOP Commercial Real Estate Development Corporation, Associate Member

HIS PROJECT EXPERIENCE INCLUDES:

CONSOL Well Pad Projects, Various Locations in Monroe and Noble Counties, OH
Provided site construction earthwork recommendations for various pads. Recommendations included fill and cut slope design and surface treatment recommendations. Scope of work included initial site assessment, overseeing subsurface exploration and laboratory testing operations, performing slope stability analysis and preparation of recommendations.

CONSOL Impoundment Project, Noble County, OH
Performed preliminary explorations to aid in site selection. For selected sites performed subsurface exploration, laboratory testing and prepare geotechnical report for site work on an impoundment with large excavations and fills for a site with difficult topography and subsurface conditions. Work also included oversite of construction observation including installation of drainage, toe key excavation and fill placement.

Mountaineer Race Track and Gaming Resort, Chester, WV
Mr. Hooper provided foundation recommendations for the construction of a new gaming facility including a five story hotel, event center, dormitory and various other infrastructure including water towers and pavements.

City of Pittsburgh Schools, Pittsburgh, PA
Provided geotechnical services for renovation of the Miller African Centered Academy. These services included foundation recommendation along with site development recommendations. Subsurface conditions included deep fills, mine spoil and deep mined coal seams.

MTA Manufacturing Facility, Houston, PA – Provided emergency recommendations for equipment support and floor slab rehabilitation for this heavy equipment manufacturing facility.

PennDOT SR 6219 Bridge over Buffalo Creek, Somerset County, PA
Mr. Hooper provided preliminary and final foundation design recommendations for proposed twin 5-span structures (1,100 feet long). Recommendations consisted of a mix between shallow foundations, piles, drilled shafts, and footings on fill. Recommendations also included mine grouting.

Slope Remediation Pennsylvania Turnpike, Scranton, PA
Responsible for assessing an unstable soil slope for an embankment on the NE extension of the Pennsylvania Turnpike. Mr. Hooper was responsibilities for performing site reconnaissance, stability analyses of existing slopes and viable remedial alternatives, engineering cost analysis, and reporting.

I-279 Slope Evaluation, Pittsburgh, PA
Performed exploration and remediation design for several small landslides along the I-279 expressway in Pittsburgh, PA. Responsibilities included planning and monitoring the subsurface exploration and laboratory testing programs, performing geotechnical analysis and report preparation. Remedial designs developed by Mr. Hooper included the use of rock buttresses, lightweight fill and regrading

National Parks Service, Ellis Island Seawall Rehabilitation, Ellis Island, NY
Provided construction support services for seawall repairs, which varied according to structure types around the island, including steel sheet pile toe walls, steel H-piles with post-tensioned soil anchors, backfill replacement, anchoring and replacement of fallen granite blocks, and underwater concrete repairs.

American Electric Power Mountaineer Power Station Flu-Gas Desulfurization Expansion, New Haven, WV
Mr. Hooper served as Project Manager for geotechnical exploration and report for the construction of various additions to the Mountaineer Station associated with FGD expansion. In addition to buildings and other ancillary structures, recommendations were also provided for the support of the stack. Alternative analysis considered several deep foundation options and overexcavation and replacement of the footprint. River borings were also drilled for barge moorings.

Mahanoy and Wastehouse Dams, Mahanoy City, PA
Directed the geotechnical investigation, analysis, and design for the rehabilitation of four earth dams. Mr. Hooper performed analysis and design required to satisfy Army Corps of Engineers requirements for upstream and downstream stability. As part of the work, compatibility of synthetic drainage material, aggregate drainage material, and natural soils was determined to address the existing embankment and foundation seepage conditions. Mr. Hooper was also responsible for preparation of contract drawings and technical specifications for construction of the geotechnical aspect of the project. .

Spectra Energy Compressor Stations, Delmont and New Florence, PA
Provided oversight for foundation construction observation, soil compaction testing and concrete testing for various components of these two compressor station expansions. Work at each compressor station was for approximately 3 months.

American Electric Power Cardinal Plant and Mitchell Plant Flu-Gas Desulfurization Expansion, Moundsville, WV and Brilliant, OH
Mr. Hooper oversaw the quality control inspection for the installation of micropiles for the support of the FGD stacks. The work performed by up to 4 quality control inspectors for each project included verifying the micropiles were being installed in accordance with the specifications and design. Documentations were prepared to verify existing conditions encountered which could result in time delays or additional charges.

Mellon Client Service Center, Pittsburgh, PA
Provided foundation construction observation for this 15-story structure. Foundation included spread footings on rock and drilled shafts and were affected by the presence of an existing subway tunnel, and abandoned tunnel, and an existing roadway.

Randy L. Moulton, PE
Principal Engineer

PROFESSIONAL EXPERIENCE
38 Years

HIGHLIGHTS OF EXPERIENCE
As Principal Engineer for Triad Engineering, Inc., Mr. Moulton is responsible for corporate contract administration and overall quality control and technical quality assurance of projects undertaken by the company. Specific technical activities include preparation of geotechnical proposals, review and/or preparation of subsurface exploration programs, evaluation of geotechnical data and review and preparation of detailed geotechnical reports. Technical specialties also include design of deep foundations, in particular rock-socketed caissons, design of various types of retaining walls, evaluation of groundwater and seepage problems, and design of earth and earth-rock dams. Mr. Moulton has also been responsible for managing design of corrective measures at sanitary landfills under the Landfill Corrective Action Program (LCAP) in West Virginia and characterization and design of remedial measures for an old landfill in Virginia.

REGISTRATIONS, LICENSES & TRAINING
Registered Professional Engineer — WV, VA, MD, PA, NC

HIS PROJECT EXPERIENCE INCLUDES:

Loveridge Slurry Impoundment, Marion County, WV
As Staff Engineer and Project Engineer, responsible for analysis and design of a two-stage fine coal refuse impoundment for Consolidation Coal Company for the Loveridge Mine Preparation Plant. The first stage of the facility consisted of a 120-foot high earth and rock fill dam with sloping upstream soil blanket, filter/drain zone and rock blanket foundation drain. The second stage was constructed primarily of coarse coal refuse with a sloping upstream soil blanket and filter/drain zone between the soil and refuse. The overall design height of the facility was 224 feet. The second stage required 6 years to complete for a total fine refuse storage life of 20 years. Developed all hydrology and hydraulics calculations, stability evaluations, design/development report, construction drawings and technical specifications. Also responsible for preparation of permitting documents through WVDNR (now WVDEP) mining division, WV dam control division and MSHA.

The Feldspar Corporation Tailings Impoundments, Montpelier, Hanover County, VA
Served as Project Manager and technical consultant for complete safety and regulatory evaluation of several large tailings impoundments on an active mine site prior to purchase by another mining company. Work included surveying and aerial mapping, soundings to determine remaining useful storage life for tailings disposal, test borings and sampling of existing containment dikes, laboratory shear strength testing, stability analyses, and several HEC-1 analyses to determine compliance with current safety standards related to design storms. Ultimately formulated recommendations for corrective measures for various minor deficiencies and prepared plans for upgrading the outlet works for one of the larger impoundments to satisfy flood routing criteria.

Blacksville No. 2 Fine Refuse Impoundment, Monongalia County, WV and Greene County, PA
Project Manager and Senior Engineer for this combined fine and coarse coal refuse facility similar to the Loveridge Mine facility described above. Prepared all analyses and designs, reports, construction plans, and technical specifications. Also responsible for preparation of permitting documents through WVDNR (now WVDEP) mining division, WV dam control division and MSHA. Furthermore, since the facility was located on the state line, permit coordination through PADER was also required.

Morgan County Landfill, Morgan County, WV
Project Manager and Senior Engineer for design of permanent closure measures for this 17-acre landfill under the WVDEP LCAP program. The project included design of a leachate collection system, a leachate storage

tank, a new permanent access road, a surface water collection system, two new stormwater management ponds and a final closure cap. The project also required permitting through several state agencies and construction monitoring and materials testing services.

Grant County Landfill, Petersburg, WV
Served as manager for several design projects for this LCAP facility. Work initially included design of interim corrective measures for fugitive leachate seeps, failing leachate collection lagoons, and inadequate stormwater management. Further work included design of a leachate sewer system including two grinder pump stations, force main and gravity line to eliminate pump and haul expense and deliver leachate to the local sewer system. The final design and construction project included a permanent closure cap, additional leachate interceptor trenches, passive gas vents, and additional stormwater management facilities to comply with NPDES requirements.

Old Shenandoah County Landfill, Edinburg, VA
Project Manager for characterization of old unlined landfill which was contributing to contamination of the underlying groundwater table. The work included design of passive gas vents, leachate interceptor drainage blankets, additional cap grading and drainage, and design of a gravity sewer to carry leachate to an existing treatment lagoon.

New Shenandoah County Solid Waste Landfill, Shenandoah County, VA
As Principal Engineer, served as the project manager for detailed geotechnical investigation of an area for construction of a new sanitary landfill situated in karst geologic terrain. Field explorations included test pits, conventional test borings, seismic refraction surveying, microgravity surveying and air-track probes to explore anomalies detected by geophysical methods. The work also included design of preventative reinforcement measures for specific areas underlain by solutioning channels and seams so that the double liner system would remain intact in the event of subsidence. This was the first sanitary landfill proposed in a documented karst setting to be approved for construction by the Commonwealth of Virginia Department of Environmental Quality (DEQ).

Winchester Medical Center, Winchester, VA
As Principal Engineer, responsible for preparation and/or review of numerous proposals and detailed reports for geotechnical investigations at this growing regional hospital. Activities involve meeting with facilities design and construction management personnel, interaction with architectural firm and construction management firm, review of all technical data and evaluation of foundation construction alternatives. The new hospital was completed in 1990, and new facilities which have been added since then, including an imaging center, a same day surgi-center, an additional day care center, two 3-story medical office buildings, several operating rooms, an expanded emergency department and a 4-story parking garage. Worked closely with the structural engineer on the parking garage project to develop reinforced strip footings designed using modulus of subgrade reaction in lieu of drilled piers, saving over $100,000 in foundation construction costs.

National Research Center for Coal and Energy, Morgantown, WV
Senior Engineer for geotechnical investigation of a site for construction of this new multi-story research facility underlain by expansive (pyritic) shale. These materials caused severe damage to the older adjacent engineering sciences building. Accordingly, innovative foundation design approach was required to reduce the potential for heave and associated structural distress. Final foundations consisted of drilled piers (caissons) with post-tensioned rock anchors stressed to apply a foundation pressure roughly twice the anticipated maximum heave pressure.

Mary Babb Randolph Cancer Center, Morgantown, WV
Senior Engineer for geotechnical investigation of a multi-story cancer research and treatment facility located immediately adjacent to West Virginia University Hospital and Medical Center. Evaluations included deep excavations for construction of two levels underground and making use of moderate capacity spread footings constructed on weathered rock.

Lakewood Dam, Mineral County, WV
Prime designer for a 72-foot high earth dam with a normal 60-foot water depth, creating a 43-acre reservoir for a lakefront residential community south of Cumberland, Maryland. Comprehensive services included surveying and aerial mapping, subsurface exploration, laboratory testing, hydrologic and hydraulic analyses, seepage analyses, stability evaluations and preparation of construction drawings and contract documents. Special considerations included a dam break analysis with routing of the flood wave downstream to evaluate impact on an existing railroad embankment. An innovative pond drain device, consisting of high strength HDPE pipe with a hydraulically actuated valve, eliminated the need for a typical reinforced concrete riser and reinforced concrete pressure pipe. A principal spillway weir and concrete lined channel were nested in an open emergency spillway channel excavated into hard bedrock. This combination resulted in appreciable construction cost savings for the Owners. Triad also provided construction monitoring, materials testing and contract administration during construction of the project.

Lake Forest Estates Dam, Jefferson County, WV
Project Manager for evaluation of an existing non-regulated earth embankment located on private property being developed as a residential subdivision. The West Virginia DEP issued an order to evaluate the structure and bring it into compliance with current safety standards. The approximate 30-foot high dam was about 350 feet long, with no principal spillway or pond drain mechanism. Triad conducted all field explorations, laboratory testing, engineering evaluations and preparation of a design-development report. Construction drawings and technical specifications were also prepared, and Triad filed applications for all of the necessary permits. Upgrades included a new concrete lined principal/emergency spillway and a downstream berm with a flatter slope and internal drainage blanket to enhance stability.

WVDOH – Corridor "H", Baker to Wardensville, WV
Principal in charge of surveying for the boundary location of all affected properties for right-of-way acquisition, verification of existing aerial mapping with cross-sections at 100-meter intervals, stake-out of structure and roadway borings, cross sections of stream channels and stakeout of final centerline alignment.

WVDOH Route 9 Construction, Jefferson County, WV
Project Manager for a 26 month consultant inspection contract with the WVDOH for construction of an approximate 2.2-mile section of limited access 4-lane highway in the eastern panhandle of West Virginia.

WVDOH Route 9, U.S. 340 to VA State Line, Jefferson County, WV
Principal Engineer for geotechnical engineering evaluation and recommendations for three sections of proposed roadway. Included special evaluation of soil due to karst geology.

WVDOH Moorefield Bypass, Moorefield, WV
Principal Engineer for geotechnical evaluation and recommendations during design phase. Project included a 1,800 ft. span bridge.

VDOT – Virginia Route 262 Bridges B609, B613, & B614, Augusta County, VA
Principal Engineer and Project Manager for geotechnical evaluation and recommendations for three bridges along proposed Route 262 in Augusta County. Included special evaluation due to presence of existing sinkhole near one of the proposed abutments.

VDOT – Virginia Route 3, Culpeper, VA
Project Manager for survey layout services during construction phase of Route 3 widening project.

VDOT – U.S. Highway 29, Warrenton, VA
Project Manager for survey layout services of construction phase of Highway 29 widening.

VDOT – U.S. Highway 522, Frederick County, VA
Project Manager for survey layout services for construction phase of project.

Michael D. Frazee, PS

Surveying Manager, Northwestern Region

PROFESSIONAL EXPERIENCE

13 Years

HIGHLIGHTS OF EXPERIENCE

Mr. Frazee has over 13 years of diversified surveying experience. He provides daily supervision of field crews and the coordination of field and office survey work. Mr. Frazee's responsibilities also include the supervision of boundary, right-of-way, topographic, as-built, and construction surveys, construction survey stakeout calculations, courthouse deed research, production of survey mapping, scheduling of field work and crew assignments, preparation of survey related reports, and survey work estimates. Mr. Frazee has provided survey services to local and state agencies, private individuals, and large commercial, energy and industrial companies.

EDUCATION

AS, Land Surveying	Glenville State College, 2001

REGISTRATIONS, LICENSES & TRAINING

Professional Surveyor	West Virginia (#2116) (Pursuing licenses in Pennsylvania, Maryland)
MSHA Annual Certification	

HIS PROJECT EXPERIENCE INCLUDES:

Steckman Ridge Project, Bedford County, PA
As Project Manager and Chief-of-Surveys, directed field crews and prepared mapping for various surveys related to a natural gas compressor station project and several miles of gas transmission lines. Worked included a boundary survey resulting in two subdivision plans, staking out locations of proposed gas wells, and the survey and mapping of over 30 well location/pipeline easement plats required for the project.

River Road and Route 131 Road Slide Projects, Morgantown, WV and Bridgeport, WV
As Survey Supervisor, directed field crews in the performance of cross section surveys and construction stakeout survey services. Responsible for directing office personnel in the preparation of cross section mapping, cross section volume calculations, and construction layout calculations. The projects included the replacement of roadway in embankment slide areas and the construction of new pile walls. The work was performed in conjunction with the West Virginia Department of Highways.

River View Place Project, Morgantown, WV
As Survey Supervisor, performed an ALTA / ACSM Land Title Survey. Supervised field crews and office personnel in the production of base mapping required for land development purposes. Project entailed a proposed housing complex and parking garage for an entire city block.

SCI Laurel Highlands and Mostoller Landfill Green Power Project, Somerset, PA
As Chief-of-Surveys, directed field surveys on a 5 mile in length landfill gas and leachate/wastewater pipeline project. The project involved an 8" HDPE landfill gas and 6" HDPE leachate/wastewater transmission line across private property and along road right-of-way lines. Responsible for the development of base mapping, creation of existing grade profiles, property line surveys for pipeline easements and right-of-ways and the production of various easement/right-of-way plats. Also, provided survey stakeout services needed for the construction of the pipeline and related structures. Directed as-built field surveys and prepared related mapping.

Columbia Gas Transmission Line Project, Waynesburg, PA to Masontown, PA
As Party Chief, performed field surveys to prepare existing grade/location profiles for the purposes of upgrades to an existing transmission line. The work included GPS and conventional survey methods.

WorleyParsons Proposed Somerset Power Project, Reels Corner, PA
As Chief-of-Surveys, coordinated and supervised an ALTA/ACSM Land Title Survey on approximately 350-acre parcel of ground for a proposed power generation facility. Work included boundary survey, utility and roadway locations, deed research, and final mapping.

Proposed Duke Energy Frederick Power Project, Frederick, MD
As Party Chief, performed boundary related surveys necessary for the production of various easements and right-of-ways. Conducted topographic surveys for the design and development of intake/discharge pipelines from the proposed plant site to the Potomac River. Provided stakeout locations of boreholes needed for drilling/core sample services.

EME Homer City Generation Power Plant Facility, Homer City, PA
As Chief-of-Surveys, coordinated and supervised multiple projects related to the development and daily functions of the power plant facility. Projects included setting ground control for several aerial flights, surveying and calculating volumes for refuse and coal stockpiles, construction survey layout, and multiple topography survey and mapping projects for site development.

EME Homer City Generation Two-Lick Reservoir, Homer City, PA
As Chief-of-Surveys, oversaw the survey of benchmarks at Two-Lick Creek Reservoir. The benchmarks at the dam are surveyed on a yearly basis to monitor the potential movement of the dam facilities. New survey information was then compared to previous data to determine any movement.

Wheeler Brothers Cannell Drive Subdivision, Somerset, PA
As Project Manager and Chief-of-Surveys, coordinated field and office survey functions for a 20-lot subdivision. Duties included the boundary survey, topographic survey, utility locations, lot calculation and layout, road design and alignment, and final mapping preparation.

Allegheny Design Services
Consulting Engineers

DAVID R. SIMPSON, PE, SECB, MBA
PRESIDENT / PRINCIPAL ENGINEER

Education:

West Virginia Institute of Technology - B.S. Civil Engineering
West Virginia University - Masters Business Administration
West Virginia State College - Architectural Technology Courses

Professional Registrations:

Year first registered: 1984
West Virginia, Pennsylvania, Maryland, Virginia, District of Columbia, South Carolina, Ohio, Structural Engineering Certification Board and National Council of Examiners for Engineering and Surveying

Professional Memberships:

American Society of Civil Engineers, Structural Engineering Institute, Charter Member, American Concrete Institute, American Institute of Architects – West Virginia Chapter, American Institute of Steel Construction, Inc., American Iron and Steel Institute Member, Associated Building Contractors (ABC)

Professional Experience:

Responsible for strategic management, marketing, quality control, personnel development, business development, project management and design at Allegheny Design Services. Experience includes over 32 years in structural design and project management for industrial, commercial, institutional, and nuclear/chemical facilities utilizing steel, concrete, masonry, and wood. Past accomplishments include design and construction administration of health care facilities, hotels, schools, shopping centers, aircraft hangars, numerous retail facilities, and numerous forensic engineering assignments. Experience has been obtained from the following assignments:

Experience Record:

Allegheny Design Services, LLC, President,	May 2002 to Present
R.M. Gensert and Associates, Vice President,	August 1998 to May 2002
WVU, Assoc. Director of Planning, Design & Construction	August 1988 to August 1998
Simpson Engineering, Owner	August 1988 to August 1998
CECO Buildings Division, Senior Structural Engineer	April 1985 to August 1988
Rockwell International, Facility Structural Engineer	March 1982 to April 1985
Bellard Ladner & Assoc., Staff Structural Engineer	Sept. 1981 to March 1982
PPG Industries, Facility Structural Engineer	January 1980 to Sept. 1981

Project Experience Includes:

Morgantown Event and Conference Center, Morgantown, WV
Phipps Conservatory Addition, Pittsburgh, PA
Waterfront Hotel and Conference Center, Morgantown, WV
WVU Basketball Practice Facility
WVU Mountaineer Field North Luxury Suites
UPMC Hillman Cancer Center
William Sharpe Hospital Addition
Chestnut Ridge Church
University of Pittsburgh Bio Medical Tower
Glade Springs Hotel & Conference Center
Fairmont State University Parking Garage

Allegheny Design Services
Consulting Engineers

GARY M. (MIKE) CHANCEY, P.E., LEED AP
MEP DEPARTMENT MANAGER

Education:

West Virginia Institute of Technology - B.S. Electrical Engineering

Professional Registrations:

Professional Engineer, West Virginia, Ohio, Pennsylvania and Maryland
LEED Accredited Professional

Professional Memberships:

National Society of Professional Engineers
West Virginia Society of Professional Engineers
American Institute of Architects – WV Chapter
U.S. Green Building Council

Continuing Education:

2013 Commercial Buildings Energy Code Workshop—ASHRAE 90.1—2007—West Virginia University
2013 Lightfair International, Philadelphia, PA

Professional Experience:

Responsible for project management and electrical design at Allegheny Design Services. Experience includes over 20 years in electrical design and project management for industrial, commercial, residential, institutional, educational, and recreational facilities. Building system design includes lighting, site lighting, power distribution, communications, surveillance, access control, and fire protection. Past accomplishments include design and construction administration of health care, schools, municipal, sports, commercial and retail facilities.

Experience Record:

Allegheny Design Services, LLC, MEP Project Manager	June 2009 to Present
MSES Consultants, Project Electrical Engineer	August 1990 to June 2009
Triad Engineering Consultants, Staff Electrical Engineer	May 1988 to August 1990
Duke Power, Design Engineer	August 1985 to May 1988

Project Experience Includes:

Experience includes estimating, design, project management, coordination, and project engineering for construction projects:

Parish Center for Immaculate Conception Church, Clarksburg, WV
Mountaineer Medical Office Building, Bridgeport, WV
WVU Visitor's Resource Center, Morgantown, WV
Upshur County 911 Center, Buckhannon, WV
Morgantown Event Center, Morgantown, WV
WVU Percival Hall Chiller Replacement, Morgantown, WV
Mylan Pharmaceuticals, Greenbag Road Facility, Morgantown, WV
Bank of Gassaway, Flatwoods, WV
Veterans Nursing Facility, Clarksburg, WV
Harrison Co. 4-H & Recreation Center, Clarksburg, WV
Robert L. Bland Middle School Renovation, Weston, WV
Stonewall Jackson Resort Lodge, Stonewall Jackson Lake, WV
Ripley Municipal Building, Ripley, WV
Wheeling Jesuit Science and Technology Building, Wheeling, WV
VAMC Primary Care Renovation, Clarksburg, WV
National Guard Hangar, Harrison Marion Regional Airport, Bridgeport, WV
Fairmont State University Athletic Field Lighting, Fairmont, WV
Harrison Marion Regional Airport Runway Extension, Bridgeport, WV
Various school renovations and additions
Streetscape projects in Clarksburg, Bridgeport, Weston, Morgantown, and WVU

PERSONS IN CHARGE OF THE PROJECT

Mr. Daniel L. Miller, P.E., is proposed as the Project Manager for the DNR's Parks Improvement Project. Mr. Miller has over 35 years of combined water/wastewater engineering experience and was selected as the Project Manager due to his most recent experience with the Town of Rivesville, West Virginia, Water System Improvements Project. That project is also located within the Region VI Planning and Development's purview. It was a significant expansion and included many aspects of your potential projects. His prior experience with the City of Romney is also relevant to what the DNR is seeking. That project included construction of a new water treatment plant, raw water intake, raw water pumping station, waterline replacements, a finished water pumping station, chlorination, water storage tanks, and telemetry. Mr. Miller's experiences and the knowledge that he brings to Skelly and Loy will be beneficial in assisting the DNR with a successful project.

As Project Manager, Mr. Miller is responsible for timely project execution and management of the project team and will serve as the principal point-of-contact with the DNR. The Project Manager is also responsible for project planning and scheduling, resource allocation, management and coordination of subconsultants, cost and productivity tracking, man-hour tracking, project documentation, and the quality of service. Mr. Miller will be responsible for overall quality and will make certain that all documents, procedures, and project activities meet DNR, DEP, BPH, and Skelly and Loy standards.

The Project Manager is responsible for ensuring that all personnel assigned to a project are technically proficient and informed of all client requirements. Tasks delegated to subordinates in each discipline as applicable are to be properly detailed and appropriate levels of authority clearly specified and made known to all project personnel. Mr. Miller will assist with any staffing needs, allocate resources, oversee contract schedule and cost, coordinate field work and reporting, and identify and resolve potential problems or conflicts.

Mr. Gerald Longenecker, P.E., will serve as our Program Manager and QA/QC Director for your project. Mr. Longenecker (WV P.E. 018491) is designated as the Engineer in Responsible Charge with the West Virginia State Board of Registration for the Certificate of Authorization (C00687-00) issued to Skelly and Loy, Inc. As Executive Vice President and an Associate of the firm, Mr. Longenecker provides oversight and management and technical direction on services performed by the company's Engineering Services Group in its multi-state office locations. A licensed Professional Engineer, Mr. Longenecker has 35 years of experience in the engineering consulting field including 22 years as an employee of Skelly and Loy. His experience has been gained through management and technical participation in a broad range of projects including civil, water, and wastewater facilities planning and design; surveying; stormwater management; stream restoration; watershed assessment; environmental engineering; urban redevelopment; site development; comprehensive planning; and other related projects.

As a Skelly and Loy Executive Vice President, Mr. Longenecker has complete authority to schedule or reschedule the assignment of necessary personnel and resources to ensure that the Project Manager can complete the assigned work.

Resumes for Mr. Miller and Mr. Longenecker, along with Skelly and Loy's West Virginia Certificate of Authorization and West Virginia Professional Engineer license, follow.

DANIEL L. MILLER, P.E., Senior Environmental Engineer

EDUCATION:
B.S., Engineering Physics/ Chemistry, West Virginia Wesleyan College, 1978

Associate, Chemistry/ Physics, Butler County Community College, 1976

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:
Professional Engineer, PA, [redacted]

Engineer-in-Training, CO

OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training

OSHA Hazardous Waste Site Supervisor

OSHA 10-Hour Construction Safety Training

AWWA - Risk Assessment Methodology for Water Systems

PROFESSIONAL AFFILIATIONS:
American Water Works Association

Pennsylvania Rural Water Association

Pennsylvania Municipal Authority Association

Water Environment Federation

West Virginia Municipal League

YEARS OF EXPERIENCE:
36 Years

A licensed Professional Engineer, Mr. Miller serves as a Project Manager and Design Engineer for the Environmental Engineering Services Group. He has combined experience in environmental and process engineering. His expertise is in the area of water, wastewater, and groundwater treatment systems. He has extensive experience with physical/chemical and biological treatment systems. He has experience with all aspects of the design and construction process. He has performed process design; detailed design; and equipment procurement, installation, startup, and troubleshooting activities. He has been responsible for the implementation and construction management for several projects at a variety of industrial and municipal sites. He has served as project manager for numerous treatment facility projects and has assisted with regulatory negotiations and the approvals process.

PROFESSIONAL EXPERIENCE

Potable Water Systems Engineering - Mr. Miller has provided ongoing potable water system engineering and consulting for numerous existing municipal and privately owned public water systems. Serving as the appointed Engineer of Record, his services performed include preliminary system evaluations, operations consulting, infrastructure management/capital improvement plan preparation, capacity/expansion analysis (source, treatment, distribution, and storage), budget and user rate evaluations, permit renewals, evaluation of impacts due to new regulatory requirements, and design of new facilities or modification to the system infrastructure.

Mr. Miller's experience includes new sources and design of new systems for existing areas and new developments not currently served by a public water system. These services included identification of potential sources, evaluation of the source options, testing of the selected source, preparation of Public Water Supply permit applications, and preparation of design drawings for the construction of source, treatment, distribution, and storage facilities. His experience has primarily been within Pennsylvania and West Virginia, although it branches farther. He is experienced with West Virginia's Infrastructure and Jobs Development Council (IJDC) and its funding/approval process, the Pennsylvania Infrastructures Investment Authority (PennVest), and some of the federal programs such as Small Cities Block Grants (SCBG) and Community Development Block Grants (CDBG).

PROJECT EXPERIENCE

Potable Water

Water Supply Line Project, Town of Rivesville, West Virginia - Project Manager and engineer for the preparation of the design and bid package for the replacement of the main water supply line from the City of Fairmont to the Town of Rivesville. This project was unique in that there were competing projects submitted to the WVIJDC. Additionally, this project was selected over competing project to move forward by the IJDC Consolidation Committee.

Emergency Waterline Replacement Project, Town of Rivesville, West Virginia - Project Manager and Design Engineer for a replacement of a waterline replacement project for a waterline that crossed beneath the railroad. The project that was completed on an emergency basis due to the onset of winter weather. The total cost of the project was approximately $410,000. Mr.

Miller succeeded in obtaining permits from the railroad in short time and having the project funded 100% by grant money from the WV Infrastructure and Jobs Development Council (WVIJDC).

Water Treatment System Construction and Startup, City of Romney, West Virginia - Project Manager managed budgets, supervised construction management, performed the startup, and provided ongoing operation support for a 1.2 MGD surface water treatment system which included both physical and chemical pretreatment to remove turbidity, iron, and manganese followed by conventional sand filtration, chlorination, and fluoride addition. This project also included waterline extensions, construction of a new waterline, construction of a new intake, a 450,000-gallon additional storage tank, and computer controls with a telemetry system.

Water System Improvements Project, Rivesville, West Virginia - Project Manager and Engineer for preparation of the design and bid package for this $5.1 million water improvement project which included line replacement, line extensions, addition of fire protection, a chlorine booster station, and storage tank work.

Grant Application, Water System Improvements Project, Rivesville, West Virginia - Project Manager and Engineer for preparation of the application to the West Virginia IJDC for this $5.1 million water improvement project which included line replacement, line extensions, addition of fire protection, a chlorine booster station, and storage tank work. Funding requests totaled $2,500,000 in grants and $2,585,276 in a 0% interest 40-year loan.

Harmony Borough Water Authority, Harmony Borough, Pennsylvania - Engineering Consultant for a surface water treatment and distribution system rated for 216,000 gallons per day (gpd) production. Work consisted of meeting attendance, assistance with capital budget, permitting assistance, negotiations for inter-municipal agreements, preparation of plans and specifications for ongoing projects, and review of developer-proposed projects.

Water Line Extension Projects, Design and Construction, Harmony Borough Water Authority, Harmony, Pennsylvania - Project Manager responsible for designing, bidding, and providing construction support services for several waterline projects. These have included replacement of aged waterlines, stream crossing, and typical extension projects. Sought financing through PENNVEST.

Claysville Donegal Joint Municipal Authority (CDJMA), Claysville, Pennsylvania - Engineering Consultant for a surface water treatment and distribution system rated for 260,000 gpd production and a wastewater collection and treatment system rated for 160,000 gpd. The wastewater treatment system employs rotating biological contacts with chlorination/de-chlorination. Work consisted of meeting attendance, assistance with capital budget, permitting assistance, negotiations of inter-municipal agreements, grant application preparation, preparation of plans and specifications for ongoing projects, preparation of Chapter 94 reports, performing and documenting the annual dam inspection, and review of developer proposed projects.

Long-Term Planning Study and Needs Analysis Report, Harmony Borough Water Authority, Harmony, Pennsylvania - Project Manager assisted in the identification of the system's long-term needs and goals. Budgetary project estimates were developed for each identified project and the projects were ranked for priority of need.

User Rate Analysis and Recommendation, Harmony Borough Water Authority, Harmony, Pennsylvania - Project Manager who prepared a detailed financial analysis of the client's budgets, anticipated projects, customer base, and rates. Responsible for coordinating with the Authority and the team, identifying long-term needs, preparing estimated projects costs, and developing different rate structures for analysis by the financial subconsultant.

Confluence Water System Improvements Project, Confluence Borough Municipal Authority, Confluence, Pennsylvania - Civil Design Engineer for water system improvements of a new 100,000-gallon storage tank and 18,000 linear feet of new waterline. Duties included designing some the water treatment system and performing quality assurance and control reviews of the water system design.

Operations Assistance, Water System, St. Francis College, Loretto, Pennsylvania - Project Engineer for assistance in resolving operation problems encountered with the distribution system and water quality. On different occasions, problems with coloration and odor occurred for this 0.2 MGD plant. Mr. Miller assisted the water system personnel in identifying and resolving the cause.

Permitting Assistance, Water System, St. Francis College, Loretto, Pennsylvania - Project Engineer for assisting in obtaining a permit for NPDES discharge of backwash effluent and tank overflow for this 0.2 MGD plant. Mr. Miller assisted the facility's administrator in obtaining the permit.

NOV Resolution, Pequea Valley School District, Lancaster County, Kinzers, Pennsylvania - Project Manager and negotiator in addressing and resolving a violation of the Lead and Copper Act associated with the potable water system at the high school. Project included advising the District as to how to respond to the NOV and negotiating with the PA DEP for a resolution of the situation.

Ebensburg Water Line Replacement Project, Ebensburg Borough, Ebensburg, Pennsylvania - Civil Design Engineer for developing details for replacement of water mains within the project area for a larger sidewalks improvement project.

Permitting Assistance, Pequea Valley School District, Lancaster County, Kinzers, Pennsylvania - Project Manager to obtain construction and operations permits for five different water treatment systems providing water softening, nitrate removal, pH adjustment, and corrosion control for five different school buildings within the District. This work included specifying revisions to the existing systems and assisting the District to self-perform the recommended modifications. This work also included developing standard operating procedures for system monitoring and water quality sampling.

Permitting Assistance, Franklin County General Authority, Chambersburg, Pennsylvania - Project Manager and Engineer who prepared and submitted the modules required to obtain modification to the water supply permit for the Franklin County General Authority water treatment plant. The permit was to allow the use of potassium permanganate as a chemical oxidant for the removal of manganese from the raw water source. The water system is rated at 1.0 MGD treatment capacity. Treatment for manganese removal is occasionally required during inversion of the reservoir.

Water System Improvements Project, Franklin County General Authority, Chambersburg, Pennsylvania - Civil Design Engineer for preparation of design documents, plans and specifications, bidding and negotiation, construction phase engineering support, and the one-year follow up certifications for a backwash handling system to treat backwash and clarifier sludge to suitable levels for discharge to NPDES outfall and the sludge management system for the solids waste stream.

Water Treatment Facility Installation, Alfred Merritt Smith WTP, Southern Nevada Water District, Las Vegas, Nevada - Project Engineer who performed the construction management for the water filters (filter underdrain, support gravel, and filter media) for the multi-million dollar expansion of the existing 10 MGD plant to double the capacity to 20 MGD. Duties included performing all aspects of product verification testing and directly supervising construction activities for the filters.

Bedford Dwellings, Urban Redevelopment Authority of Pittsburgh, Pittsburgh, Pennsylvania - Senior Civil Engineer for design of water, sewer, and roadway improvements based on design recommendations from the study of two projects. These projects included the analysis of the existing utilities and the subsequent design of the Phase 1A infrastructure improvements which encompassed eight square blocks within the City of Pittsburgh. Performed quality assurance and control reviews of the water system design.

PUBLICATIONS

Lawrence, Alonzo Wm.; Miller, Daniel L.; Miller, Jeffrey A.; Raetz, Richard M.; and Hayes, Thomas D.; In-Situ Bioventing for Environmental Remediation of a Natural Gas Dehydrator Site: A Field Demonstration, to be presented at the 1994 Society of Petroleum Engineers (SPE Paper 28351), Annual Technical Conference and Exhibition, New Orleans, Louisiana, September 25-25, 1994.

Lawrence, Alonzo Wm.; Miller, Jeffrey A.; Miller, Daniel L.; and Hayes, Thomas D.; Natural Gas Industry Produced Water Treatment and Disposal Options, Presented at the University of Tulsa and Pennwell Books Environment/Issues and Solutions in Exploration, Production and Refining, Houston, Texas, March 2-4, 1994.

Lawrence, Alonzo Wm.; Miller, Jeffrey A.; Miller, Daniel L.; and Hayes, Thomas D.; Produced Water Treatment and Disposal Options in the Natural Gas Production Industry, Presented at the American Filtration Society Texas Chapter 4th Annual Produced Water Seminar, League City, Texas, January 20-21, 1994.

Smith, J. R., Chavez, R. P., Miller, D. L., and Gutierrez, M., Sand Filtration/Activated Carbon Treatment of Pumped Groundwaters from a Coal-Tar Superfund Site for NPDES Discharge. Presented at Water Pollution Control Federation 63rd Annual Conference, Washington, D.C., October 7-11, 1990.

Smith, J. R., Chavez, R. P., Miller, D. L., and Matsik, G. A., Sand Filtration/Activated Carbon Treatment of Pumped Groundwaters from a Coal-Tar Superfund Site for NPDES Permit. Paper to be Presented at the 23rd Mid-Atlantic Waste Conference, Pittsburgh, Pennsylvania, June 4-7, 1991.

DANIEL L. MILLER, P.E., Senior Environmental Engineer

GERALD W. LONGENECKER, P.E., Vice President, Engineering Services

EDUCATION:
M.S., Agricultural Engineering, 1980, The Pennsylvania State University

B.S., Agricultural Engineering, 1979, The Pennsylvania State University

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:
Professional Engineer, WV, MD, PA, NJ, DE, TN, NC, NM

RELEVANT TRAINING:
Rosgen Level I, "River and Stream Classification/Fluvial Geomorphology Stream Restoration" Short Course, Dave Rosgen, Professional Hydrologist, 1996

Rosgen Level II, "River Morphology and Applications" Short Course, Dave Rosgen, Professional Hydrologist, Pagosa Springs, Colorado, 1997

Rosgen Level III, "River Assessment and Monitoring" Short Course, Dave Rosgen, Professional Hydrologist, Pagosa Springs, Colorado, 1997

Rosgen Level IV, "River Restoration and Natural Channel Design" Short Course, Dave Rosgen, Professional Hydrologist, Pagosa Springs, Colorado, 1997

YEARS OF EXPERIENCE:
35 Years

A licensed Professional Engineer, Mr. Longenecker has 35 years experience dealing with the regulatory approval process in the environmental consulting field. This experience has been gained through the management and technical participation in a broad range of projects including stream restoration, watershed assessments, stormwater management, solid waste handling, industrial and sanitary wastewater treatment, dam safety, water resources engineering, and wetland-related evaluations. As an Associate and Vice President of the firm, Mr. Longenecker directs the Engineering Service Group.

PROFESSIONAL EXPERIENCE

Potable Water Systems - Managed the engineering design efforts associated with numerous potable water supply and distribution systems. Representative projects have included projects completed for the Philadelphia Water Department on numerous rerouting and looping efforts as part of potable water system infrastructure protection projects. Projects have included a new 100-foot span bridge to support a sanitary sewer pipeline with an associated relocation of a 24-inch potable water main routed underneath the stream channel and protected with grade control structures. Other projects have involved rerouting lines embedded in the subgrade of the roadway crossing deteriorating stone arch bridges. Additional municipal and private water distribution projects have involved designing additional storage structures, connection systems and pumps for supplemental water source connections to the existing potable water systems, storage tank sensors, well pump control and altitude valve upgrades and distribution system leak detection and repair.

Domestic Wastewater Design and Management - Mr. Longenecker has provided Project Management and technical oversight of several ongoing wastewater system engineering consulting for numerous existing municipal and privately owned permitted wastewater systems. Services performed include operations consulting, infrastructure management/capital improvement plan preparation, evaluation of collection system infiltration and inflow, capacity expansion (both collection and treatment) evaluations, permit renewals, and evaluation of impacts due to new regulatory requirements.

Wastewater Treatment - Managed the design of several pump stations involving sanitary wastewater systems serving residential, commercial, and light industrial areas and including submersible, self-priming, and wet well/dry application systems. One representative project served the Commerce Business Park office complex to provide sanitary wastewater conveyance to tie in to a public sewer system. The system consisted of duplex submersible pumps with integrated backup power generation. Assessed numerous malfunctioning wastewater systems and developed retrofitting and renovating programs to remediate the problems. Conducted analysis of impacts on the hyrdogeological regime from discharges of wastewater. Analyses have involved Dupuit-Forscheimer, Colorado State, HELP, and other computer groundwater models. Managed the design of more than 200 land application systems involving a variety of developments and wastewater flows from a few hundred to 1.4 million gpd including subsurface, spray irrigation, and overland flow system.

Acid Mine Drainage - Managed the design of a mine drainage treatment system at a 1,000-acre coal mine. The project focused on the restoration of the impacted receiving streams and improving water quality sufficiently to support native aquatic life. Evaluated the economics and performance of chemical treatment and passive treatment systems used for treating degraded water quality at a reclaimed surface coal mine preparation plant in Alabama. Primary

drainage sources included a gob pile, slurry lakes, and upgradient abandoned mine lands. Managed a 1000-acre coal mine project dealing with a transition from an active operation to a reclamation status. Efforts included performing water balances, hydrogeologic assessments, NPDES permit revision negotiations, evaluation and design of passive mine drainage treatment systems, and general permit coordination with the federal and state regulatory agencies.

Erosion and Sedimentation Control - Prepared Erosion and Sedimentation Control Plans for a variety of developments. These have included temporary and permanent control features and have involved the use of several stabilization techniques. Performed an assessment of upstream tributaries to a recreational lake to evaluate sedimentation sources and loading and designed a water quality monitoring program which will result in the development of mitigation measures to address sedimentation pollution and other water quality impacts.

Stormwater Management - Managed the design of numerous stormwater runoff control facilities to minimize downstream impacts. Impacts included the control of flooding events and peak runoff rates, as well as to limit the pollutant and sediment loads experiences by downstream areas. Directed the analysis of stormwater control facilities applied to a 1,400-acre development site. Analysis was focused on evaluating innovative and alternative techniques which would enhance groundwater recharge while controlling pollutant loads. Supervised numerous watershed modeling projects using HEC-II models for developing design bases for culverts and bridge crossings.

Solid Waste - Evaluation of disposal alternatives for municipal sewage sludge being produced at a rate of 15-20 tons per day. Project Engineer for the design and permitting of a 500-ton/day solid waste transfer station and recycling facility. Project included offering testimony pertaining to the methods of separation and compaction, liquids containment, and the overall system operation. Designed a leachate-collection, recirculation, and treatment system for an 80-acre municipal waste landfill.

Geotechnical Engineering - Managed the design and construction of a four-million-gallon winter storage lagoon overlaying special concrete conditions with geofabric and hypalon. Conducted permeability testing during construction to ensure compliance with compaction specifications. Managed carbonate region site assessments to delineate sinkhole areas and develop remediation programs. Managed site testing program and data analysis for foundation design and secondary containment berms for a 0.5-million-gallon chemical storage tank. Managed soil boring and geotechnical laboratory programs in limestone regions to evaluate subsurface conditions for foundation and groundwater flow analysis purposes.

Dam Safety - Technical project coordinator for the design and construction surveillance of safety modifications performed on an earthen dam embankment and concrete spillway of a 100 acre-foot impoundment in Pike County, Pennsylvania, under the Pennsylvania Dam Safety Program.

Environmental Assessments/Site Remediation - Project Engineer for an on-site assembled oil/water separator used for the recovery of diesel fuel from the groundwater system. Spill was approximately 8,000 gallons. Managed an Environmental Risk Assessment required as a condition of a loan for a partially developed office park. The assessment included radon testing, an on-site inspection for potential spill areas, and review of the regulatory framework requiring compliance.

PUBLICATIONS

- "Stormwater Attenuation and Gully Repair in Carpenters Woods, Wissahickon Valley Park, Philadelphia," Moses, T., Aungst, D., and Longenecker, G., AWRA Annual Conference, November 1-4, 2010, Philadelphia, Pennsylvania.
- "A Case in Study in Water Management Using Spray Irrigation"; Lakatos, David F. and Longenecker, Gerald W. ; presented at the 1982 Summer Meeting of the American Society of Agricultural Engineers; University of Wisconsin-Madison; June 27-28, 1982.
- "Land Application for a Countryside Campground"; Longenecker, Gerald W. and Zeigler, Alan L.; presented at the 1982 Winter Meeting of the American Society of Agricultural Engineers; Palmer House, Chicago, Illinois; December 14-17, 1982.
- "Passive Treatment of Acid Mine Drainage - A Mine Wastewater Treatment Alternative", David Turner, Gerald W. Longenecker and William C. Cantrell. Seventh Tennessee Water Resources SYmposium, Nashville, Tennessee. February 24-26, 1997.

CERTIFICATE OF *Authorization*

STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

The West Virginia State Board of Registration for Professional Engineers having verified the person in responsible charge is registered in West Virginia as a professional engineer for the noted firm, hereby certifies

SKELLY & LOY, INC.
C00687-00

Engineer in Responsible Charge: GERALD W LONGENECKER - WV PE 018491

has complied with section §30-13-17 of the West Virginia Code governing the issuance of a Certificate of Authorization. The Board hereby notifies you of its certification with issuance of this Certification of Authorization for the period of:

January 1, 2015 - December 31, 2017

providing for the practice of engineering services in the State of West Virginia.

IF YOU ARE REQUIRED TO REGISTER WITH THE SECRETARY OF STATE'S OFFICE, PLEASE SUBMIT THIS CERTIFICATE WITH YOUR APPLICATION.

IN TESTIMONY WHEREOF, THE WEST VIRGINIA STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS HAS ISSUED THIS COA UNDER ITS SEAL AND SIGNED BY THE PRESIDENT OF SAID BOARD.

BOARD PRESIDENT

The State of West Virginia

STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

To all to whom these presents shall come Greeting

"Know Ye" That The State Board of Registration for Professional Engineers of the State of West Virginia, reposing special confidence in the Intelligence, Integrity and Discretion of

Gerald W. Longenecker

DOES IN PURSUANCE OF AUTHORITY VESTED IN IT by law hereby certify that he having submitted satisfactory evidence of his ability and experience is a

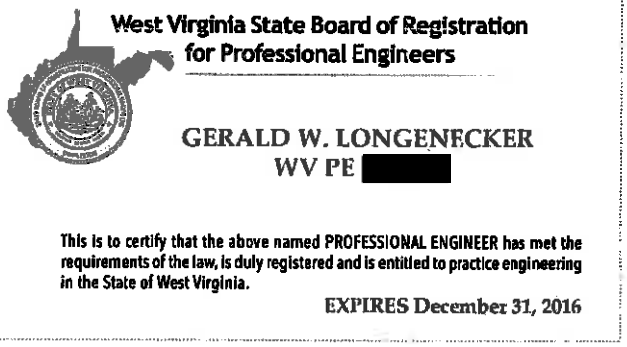
REGISTERED PROFESSIONAL ENGINEER

Registration Number [redacted]

To Hold and use such title in the practice of his profession, subject to the conditions prescribed by law.

Given under the hand of the Seal of the Board at the Capitol in the City of Charleston, This 11th day of January in the year of our Lord 2010 and of the State the One Hundred Forty-Sixth

Members of the Board



GERALD W. LONGENECKER
SKELLY & LOY, INC.
449 EISENHOWER BOULEVARD SUITE 300
HARRISBURG, PA 17111

COMPLIANCE PLANS TO OBTAIN PROJECT GOALS

The Watoga State Park Wastewater Improvement project will meet project goals and objectives as detailed in Table 1. This includes coordination with owners at each phase to ensure planned next steps meet their needs and project goals. Our experienced team will begin with ownership discussion and review of existing plans and conditions. We will then step through each project phase including, but not limited to, surveying, environmental assessment, soil and groundwater characterization, permitting and reporting, design and construction oversight, DNR compliance and operations inspections, development of maintenance procedures, and ensuring a seamless transition from the operation of the existing facilities to the newly installed facilities. Through constant coordination with the DNR and following the process outlined in Table 1, our team will ensure the project will be delivered on time and within budget – as we have demonstrated with all of the project descriptions detailed in the next section.

TABLE 1: OVERVIEW OF PROJECT GOALS AND OBJECTIVES FOR EACH PROJECT ACTION ITEM

Project Goals & Objectives	Action Item
1	**Stakeholder meetings, site surveys, and discussion**
	Oral presentations
	Review existing plans and conditions
	Prioritize owner objectives
	Formulate initial design concepts
	Assurances of design meeting continuous plant operation
	Watoga wastewater plant site survey
	Assessment of wastewater sources, collection system, and water efficiency
	Assessment of existing conditions: retrofits and/or total upgrades required
	Site mapping, GIS, and design criteria data collection
2	**Develop draft and final designs**
	Outline of DNR and owner needs, objectives, codes, laws relevant to project
	Alternative collection system and treatment technology assessment
	Detail how design will meet DNR and owner requirements
	Detail design for continuous operation of wastewater plant
	Design technical PE review and cost minimization
	Draft design presentation to owners
	Ownership comments integration
	Final design
3	**Project construction**
	Site grading/preparation
	Site installation verification
	Geo-locating of site infrastructure into GIS
	Wastewater plant operational and performance testing
	Upgraded systems placed on-line

PREVIOUS PROFESSIONAL EXPERIENCE

Our staff has been involved with numerous similar projects, and we are actively working on multiple comparable projects in the region. Our long list of successful projects demonstrates our team's ability to understand client needs, overcome challenges, and deliver an engineered solution that meets or exceeds client expectations, forecasted budgets, and project deadlines. Our experience in designing and implementation of wastewater system improvement projects is substantial, and our strong familiarity seasonal and highly variable flow design makes our team uniquely qualified to support the DNR on this project.

With all of our past projects, the project team has worked closely with client managers and staff to review the existing system, O&M records, and identify problematic infrastructure. Our project scoping and computer modeling tools were deployed to quickly assess capacity capabilities, regulatory requirements, system conditions, and O&M needs. We developed cost-savings approaches to identify infrastructure "health" and evaluate failure risk so that system improvements could be prioritized and methodically addressed. Throughout all projects, we coordinate findings with key client staff and facilitate public communication so that the project needs are clearly understood with no disruption to the project schedule. We integrated qualitative and quantitative client needs assessments into draft designs, reviewed our designs with clients, integrated input, and developed a final design that optimized system performance, sustainability, and life cycle costs. Our final design clearly defined manageable project tasks, while ensuring a master plan for long-term sustainable management of the utility. Collectively, our approach was developed so that we can better serve you by delivering a solution that meets your needs while staying on schedule and within budget.

The following section outlines Skelly and Loy's previous professional project experience.

RECENT AND/OR RELEVANT SKELLY AND LOY IMPROVEMENT PROJECTS

- Diakon Youth Center Wastewater System Evaluation and Design
- Hidden Valley Camping Resort Wastewater Treatment/Spray Irrigation System Design
- Quakerwoods Campground Wastewater Treatment System
- Camp Hebron Wastewater Treatment System Permitting, Design, and Installation
- Sleepy Creek and Mountain Springs Developments
- Engineering and Environmental Consulting Services for the White Township Municipal Authority
- Conewago Industrial Park Wastewater Treatment System Expansion
- Sandhill Pump Station Improvements, City of Lebanon Authority
- Maintenance Activities, Construction of Bypass System, and Repair of Equalization Tank at the Exelon Nuclear Power Station Wastewater Treatment Plant
- Arch Rock Subdivision Groundwater Supply Development

More detailed descriptions of each of these projects follow after the table presented on the following page which illustrates the project elements that comprise each of these projects as well as the proposed project team's experience in those areas of performance.

Watoga State Park Wastewater Improvements

Key Personnel	Office Location	Years of Experience	Degree	Registrations / Certificates	Experience	Project Scoping	Alternatives Analysis/Evaluation	Environmental Assessment	Preliminary Design	Survey	Geotechnical Investigations	Final Design	Permitting	Funding Assistance	Bid Documents/Bidding/Contract Negotiations	Engineering During Construction	Resident Project Representative (inspection)	Contract Close Out	Design/Build Project - Field Construction	Ongoing Operations
Aungst, D	Harrisburg	[illegible]	BS	PE		X	X		X	X		X	X	X	X	X	X	X	X	X
Chaney, G	Morgantown	30	BS	PE, LEED		X	X		X			X	X		X	X	X	X	X	X
Frazee, M	Morgantown	13	AS	PS		X				X					X					
Hopper, D	Morgantown	25	BS	PE		X	X		X		X	X	X		X	X	X	X	X	
Longenecker, G	Harrisburg	35	MS, BS	PE		X	X	X	X	X	X	X	X	X	X	X	X	X		
Lower, M	Harrisburg	19	BS	PE		X	X		X	X		X	X		X	X	X	X		
Miller, D	Morgantown/Pittsburgh	36	AS, BS	PE		X	X	X	X	X	X	X	X	X	X	X	X	X		
Moulton, R	Morgantown	36	MS, BS	PE		X	X		X		X	X	X	X	X	X	X	X	X	
Morse, S	Harrisburg	35	MS, BS	PE		X	X		X			X	X	X	X	X	X	X	X	X
Pitteris, M	Pittsburgh	18	BS, MS, PhD	PE		X	X		X	X		X	X	X	X	X	X	X	X	X
Reynolds, B	Morgantown	20	BS	PE		X	X		X	X	X	X	X		X	X	X	X		
Staley, D	Morgantown/Pittsburgh	40		Electrical Certified Master, Asbestos Inspection		X	X	X	X			X			X	X	X			
Simpson, D	Morgantown	35	MBA, BS	PE, SECB, MBA		X	X		X			X	X		X	X	X	X	X	

Skelly and Loy, Inc
D F Staley, Independent Contractor
Triad Engineering, Inc
Allegheny Design Services

Projects	Contract Magnitude (in Thousands)	Tasks	Project Scoping	Alternatives Analysis/Evaluation	Environmental Assessment	Preliminary Design	Survey	Geotechnical Investigations	Final Design	Permitting	Funding Assistance	Bid Documents/Bidding/Contract Negotiations	Engineering During Construction	Resident Project Representative (inspection)	Contract Close Out	Design/Build Project - Field Construction	Ongoing Operations
Dakon Youth Center Wastewater System Evaluation and Design	$200,000		X	X	X	X	X	X	X	X		X	X	X	X	X	
Hidden Valley Camping Resort Wastewater Treatment/Spray Irrigation System Design	$242,500		X	X	X	X	X	X	X	X		X	X	X	X	X	
Quakerwoods Campground Wastewater Treatment System (annual)	$15,000																X
Camp Hebron Wastewater Treatment System Permitting, Design, and Installation	$300,000		X	X	X	X	X	X	X	X		X	X	X	X		
Sleepy Creek and Mountain Springs Developments	$500,000		X	X	X	X	X	X	X	X		X	X	X	X	X	X
Engineering and Environmental Consulting Services for the White Township Municipal Authority	$2,000,000		X	X	X	X	X	X	X			X	X	X	X		
Conewago Industrial Park Wastewater Treatment System Expansion	$2,700,000		X	X		X	X	X	X	X		X	X		X	X	
Sandhill Pump Station Improvements, City of Lebanon Authority	$50,000		X							X							
Maintenance Activities, Bypass Construction, and Tank Repair at the Exelon Wastewater Treatment Plant	$559,000		X	X		X			X	X		X	X	X	X	X	X
Arch Rock Subdivision Groundwater Supply Development	$501,300		X	X	X	X	X		X	X		X	X		X	X	X

Diakon Youth Center Wastewater System Evaluation and Design
Boiling Springs, Pennsylvania

Client/Owner
RGS Associates

Diakon Lutheran Social Ministries

Project Value
Firm Responsibility: $200,000

Completion Date
September 2003

Key Components
Zero Discharge Wastewater System; Sewage Options Evaluation; Design/Build

Reference Contact
Mr. David Fralick
Diakon Lutheran Social Ministries
960 Century Drive
P.O. Box 2001
Mechanicsburg, PA 17055-0707
P: 717-319-2986

Project Manager
Stephen R. Morse, P.E.

The Diakon Youth Center (formerly known as the TresslerCare Wilderness Center) offers the unique experience of a residential treatment program combined with the challenges of outdoor activities and the wilderness for students at risk. In 2004, a more than $2 million expansion project created a new dormitory, gymnasium, and classroom at this remote wooded facility. This expansion increased the number of students who could be served and therefore increased the wastewater generated at the center. The facility was originally served by on-lot sewage treatment disposal systems that were at capacity.

Skelly and Loy, Inc. performed a wastewater treatment and disposal system analysis for a proposed expansion at the camp. The evaluation included site testing, options evaluation, and selection of an appropriate treatment and disposal system. Alternatives evaluated were subsurface disposal, sand mounds, spray irrigation, rapid infiltration, and greenhouse evapotranspiration systems. Stream discharge was not considered since the center is situated within the watershed of a high quality stream.

The limited availability of suitable soils not proposed for other uses, coupled with the desire of the center to expand the horticultural therapy program at the center, led to the selection of a greenhouse evapotranspiration system for the additional sewage generated by the expansion. The greenhouse system consists of pre-treatment by a Cromaflow package wastewater treatment system followed by sand filtration and spray irrigation within the greenhouse. There is zero discharge of wastewater to the ground, subsurface, or surface water, thus preserving the high quality of the watershed. Water is evaporated or transpired by plants and the water vapor is then released to the atmosphere by fans within the greenhouse.

Skelly and Loy performed the initial site assessment and testing, alternatives evaluation, and final system selection. We also prepared the sewage planning modules for approval by the two townships in which the center is located and then completed the final design and permit application for the construction of the system. Skelly and Loy's AMS Service Group installed the Cromaglass® treatment system and has provided ongoing operations assistance for the first four years until on-site operators were placed on staff.

Hidden Valley Camping Resort Wastewater Treatment/Spray Irrigation System Design
Union County, Pennsylvania

Client
Hidden Valley Camping Resort

Estimated Project Value
Design: $64,500
Installation: $178,000

Completion Date
Design: February 8, 2007
Construction: January 14, 2008

Key Components
Design/Build; High Quality Watershed Wastewater Treatment Design; Spray Irrigation Field Testing and Design; System Installation

Reference Contact
Mr. David Hogg
Hidden Valley Camping Resort
162 Hidden Valley Lane
Mifflinburg, PA 17844
P: 570-966-1330

Project Manager
Stephen R. Morse, P.E.

In 2007, Hidden Valley Camping Resort was a beautiful 140-acre seasonal campground located in Mifflinburg, Pennsylvania, comprised of 395 campsites, 3 residential homes, an office building and store, 2 bathhouses, and various outbuildings. Historically, wastewater generated at the campground was either treated in septic tanks with subsurface disposal or stored in tanks and hauled away by a permitted hauler. The cost for pumping and hauling the sewage was becoming prohibitive and was conducive to a potential spill.

Additionally, an unnamed tributary of Rapid Run, designated a High Quality Stream protected from degradation, passes through the middle of the campground. This watershed is also located within the Susquehanna River Basin and ultimately drains to the Chesapeake Bay. Wastewater management in a high quality watershed or within the Chesapeake Bay Basin can present unique problems, whether the objective is zero additional nutrient contribution to the Chesapeake Bay or no degradation of a high quality watershed.

At the request of the campground's owner, Skelly and Loy designed a sewage treatment and disposal system that would handle the anticipated peak wastewater flows at the campground of up to 12,000 gallons per day. The constructed treatment system consists of a preliminary solids settling tank followed by a Cromaglass® package wastewater treatment system. The final effluent is pumped to four interconnected 6,000-gallon dose tanks where it is alternately pumped through five delivery lines to five distribution laterals consisting of 10 sprinklers, each, located in a 3.6-acre spray field. The spray field is a historic farm field of pine and spruce trees that are planted in almost perfect rows. This area was selected because of the excellent nutrient uptake capability of the spruce trees; a proven way to reduce nutrient impact to ground and surface water systems. The treatment system and spray irrigation system were installed by Skelly and Loy's AMS Service Group.

At Hidden Valley Camping Resort, the benefits of this wastewater treatment and spray irrigation system include eliminating the chance for spills during pumping and hauling, eliminating the transport of additional nutrients to the Susquehanna River and, ultimately, the Chesapeake Bay, a replenishment of groundwater resources, the promotion of lush growth, providing habitat and food for certain wildlife and enhanced growth of trees with improved timber value.

Hidden Valley Camping Resort Wastewater Treatment/Spray Irrigation Design

Quakerwoods Campground Wastewater Treatment System
Bucks County, Pennsylvania

Client
Quakerwoods Campground

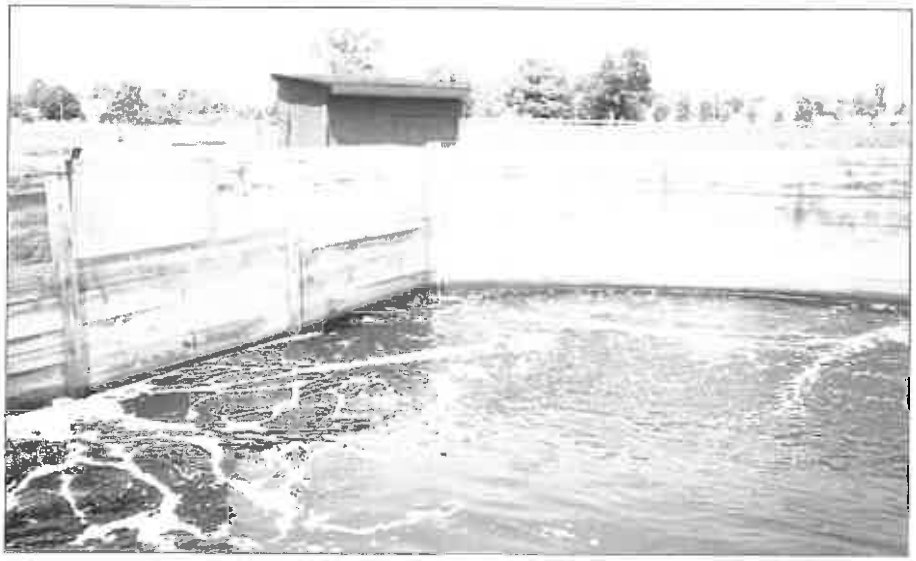
Project Value
$15,000/year

Completion Date
Ongoing, Annual Service

Key Components
Land Application of Sewage
Wastewater Treatment Ongoing Operations

Reference Contact
Mr. Tony Yu
Quakerwoods Campground
2225 Rosedale Road
Quakertown, PA 18951
P: 215-536-1984

Project Manager
Daniel R. Aungst, P.E.



Quakerwoods Campground is located west of Quakertown in Milford Township, Bucks County, Pennsylvania. The facility provides seasonal campground accommodations for recreational vehicles, travel trailers, and cabin and tent camping clientele.

Sanitary wastewater treatment facilities at the site are provided by an alternative land-based treatment system referred to as an overland flow slow-rate infiltration system. Wastewater generated from the campground is treated in a circular aeration basin. Treated effluent is then pumped using low pressure pumps to the upper end of one of two alternated sloped field areas. The fields were originally fine graded to a 2% slope and seeded with reed canary grass. Flows are distributed evenly across the head end of the fields through small diameter holes drilled in PVC piping. Applied waters infiltrate into the soil as the flows trickle down across the sloping field areas. Application rates and prevention of runoff discharge are controlled by the duration of the application cycles.

Skelly and Loy, Inc. personnel have been the treatment system operators for the past several years. Additionally, a reassessment of the treatment system's capacity and effectiveness was performed to obtain planning approval of a campground expansion project. Skelly and Loy is also performing other engineering functions associated with this expansion project inclusive of wetland impacts permitting and land development plan preparation.

Skelly and Loy also performs annual operations of this wastewater system which includes regular visits and system adjustments, discharge monitoring report (DMR) preparation, and system performance evaluation.

Quakerwoods Campground Wastewater Treatment System

Camp Hebron Wastewater Treatment System Permitting, Design, and Installation
Halifax, Pennsylvania

Client
Camp Hebron, Inc.

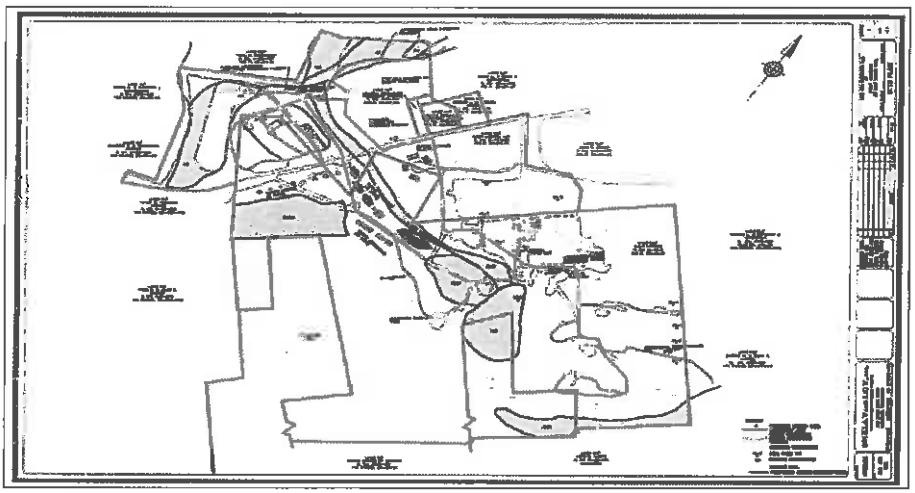
Estimated Project Value
Total: $300,000

Completion Date
2004

Key Components
Wastewater Management System Permitting and Design; Cromaglass Treatment Facility Installation

Reference Contact
Mr. Dustin Musser
Executive Director
Camp Hebron, Inc.
957 Camp Hebron Road
Halifax, PA 17032
P: 717-896-3441

Project Manager
Stephen R. Morse, P.E.



Skelly and Loy, Inc. was retained to evaluate long-term solutions for existing failing subsurface sewage disposal systems, as well as to determine management options for planned future development for this campground and retreat center. Skelly and Loy performed soil testing throughout the site to identify replacement and new subsurface disposal areas. However, the areas identified would require the removal of existing forest and regrading of existing slopes thereby disturbing the natural setting of this forested camp. Sewering of the camp with a centralized wastewater treatment facility was then evaluated to preserve the forested areas. This option was recommended by Skelly and Loy and was selected by the camp council.

Skelly and Loy performed the design and permitting for the approval of this proposed wastewater management system. The proposed system and permits were submitted for handling of the entire existing and future flows from the camp. The implementation of the sewage facilities will be done in a phased manner as environmental operations and financial concerns dictated. Skelly and Loy prepared the planning modules, NPDES (discharge) permit application, and water quality management (treatment facilities) permit application for the proposed system. These permits were prepared so that connection of existing and future wastewater flows to the system can be performed without additional permits or approvals.

The final design of the system included over 5,700 feet of sewers as well as the proposed wastewater treatment facility. A Cromaflow treatment facility was selected due to its modular nature as well as its buried and noise- and odor-free characteristics. The plant was proposed in two phases so that capital expenditure for future facilities can be delayed until needed. Both phases of this treatment system was supplied and installed by Skelly and Loy, who also provides operations assistance to the camp.

Camp Hebron Wastewater Treatment System Permitting, Design and Installation

Sleepy Creek and Mountain Springs Developments
Potable Water and Wastewater Systems Design, Ridge, Morgan County, WV

Client
Sovereign Homes, Inc.

Estimated Project Value
Total: $500,000

Completion Date
December 2008

Key Components
Planning, design, permit application preparation, construction and operations of potable water and wastewater treatment systems

Reference Contact
Mr. Wade E. Clements
Sovereign Homes, Inc.
16 Richards Avenue
Winchester, VA 22601
P: 540-662-6201

Project Manager
Stephen R. Morse, P.E.

Skelly and Loy, Inc. was retained to provide the planning, design, permit application preparation, construction, and operations of potable water and wastewater treatment systems for two developments located approximately one mile apart along U.S. Route 522 in Morgan County, West Virginia. Initially, the two developments were considered separate projects needing their own potable water and wastewater systems. Alternatives for potable water supply and wastewater treatment were evaluated for each development, but it quickly became apparent that common water and sewage systems would benefit each development by reducing costs and the number of potable water wells. These two projects were combined from the water and sewage perspective, and work proceeded to design common systems. The average daily demand for this combined development is 150,000 gpd.

Potable Water Systems

Skelly and Loy sited seven potential well locations at the two development sites, supervised the drilling of the wells, and performed aquifer tests on three potential potable water wells. The combined yield of these wells is estimated to be over 800 gallons per minute, which far exceeds the minimum requirements. Water quality testing was also performed to assure potable water quality. In addition to this source development, we also evaluated the options for water treatment and storage for both developments. In the end, three supply wells at the Sleepy Creek Development will be utilized, with water storage located on top of the ridge to the east of the proposed development. A 10,000' long water main will be installed along U.S. Route 522 to provide water service to the Mountain Springs development. Detailed construction drawings and specifications were prepared for these facilities.

Wastewater Treatment System

Skelly and Loy evaluated several treatment options and selected a Membrane Bioreactor (MBR) Biological and Enhanced Nutrient Removal (BNR/ENR) system to treat wastewater to meet the stringent discharge requirements. Due to the location of the proposed development within the Potomac River watershed, stringent nutrient reduction requirements must be met by this proposed system. One treatment facility located at the Sleepy Creek Development is proposed for treating the wastewater from both developments. A 9,740' long pump station force main along U.S. Route 522 was designed to connect those two developments. Detailed drawings and specifications were prepared for these facilities.

Permits and Construction

All related public water and wastewater permits have been issued for this project. Development of these sites has been delayed until economic conditions improve.

Potable Water and Wastewater Systems Design, Construction, and Operation

Engineering and Environmental Consulting Services for the White Township Municipal Authority, Indiana County, Pennsylvania

Client
White Township Municipal Authority

Project Value
Total: >$2,000,000

Completion Date
2012-present

Key Components
Site Assessments; Wetland Assessments; Engineering Design; Permitting; Design Document Preparation; Bid Process Assistance; Engineering During Construction; Construction Inspection; Post-Construction Site Assessments and Monitoring

Reference Contact
Mr. Milton Lady,
Township Manager
White Township
Municipal Authority
950 Indian Springs Road
Indiana, PA 15701-3506
P: 724-463-8585

Since 2012, Skelly and Loy staff have served as the Engineer-of-Record for the Municipal Authority operating White Township's sewer system. At the time of appointment, the Authority operated approximately 112,000 feet of gravity sewers, 14,000 feet of force mains, 1,200 manholes, five pumping stations, and two wastewater treatment plants. Since Skelly and Loy's appointment, the two treatment plants have been converted to pumping stations and more than a mile of new forced mains have been constructed. Typical services have included meeting attendance, capital budget and permitting assistance, inter-municipal agreement negotiations, grant application preparation, plans and specifications preparation for ongoing projects, annual Chapter 94 report preparation, and developer-proposed project reviews.

Skelly and Loy's work for the Authority has included the following:

Indian Springs Interceptor
Among the first projects completed for the Authority by our project manager as Engineer-of-Record was the rehabilitation of the main Indian Springs Interceptor. A previously developed plan called for a parallel interceptor to be constructed at an estimated cost of approximately $5 million. Our project manager evaluated and then designed an alternate plan to rehabilitate the existing interceptor. The installed project cost was approximately $1.8 million and has increased the capacity slightly beyond the necessary requirement.

Kittyhawk Pumping Station Project
The Kittyhawk Sewage Treatment plant was replaced by a pumping station. The pumping station was constructed of circular pre-cast concrete manholes six feet and eight feet in diameter, serves 23 existing homes, and is sized for approximately 40 residences. It is rated at 125 gallons per minute and currently operating at approximately 10,000 gallons per day. The gravity sewer system was redirected to accommodate the pumping station. The existing sewage treatment plant was demolished, and the National Pollution Discharge Elimination System (NPDES) permit was closed.

Pleasant View Pumping Station Rehabilitation, Site Improvements, and Emergency Generator Project
Built in the 1950s, the original plans for the Pleasant View Pumping

Station called for a complete replacement at a new location at an estimated cost of approximately $1.6 million. An assessment by Skelly and Loy determined rehabilitation of the existing structure and installation of new internal equipment and controls was a feasible alternative. These improvements, involving replacement of all internal equipment between the station's inflow and outflow flanges, were completed for a total investment of approximately $500,000, saving the Authority approximately $1.1 million in capital expenditure.

Following initial pump station rehabilitation, Skelly and Loy, with the assistance of A|E Works and Moore Design Associates, designed, permitted, bid, engineering during construction, and construction inspection of additions including an emergency generator, automatic transfer switch, and associated wiring. Site improvements included an entrance roadway, stormwater management, and landscaping. The total cost of this portion of the project was approximately $192,000.

Ramsey Run Pumping Station Project
The original Ramsey Run Pumping Station, though more recently constructed, was built in a similar fashion to the Pleasant View Station. Although mechanical equipment such as the pumps were in good working condition, the controls, electrical distribution equipment, and wetwell instruments were aged and obsolete. A rehabilitation was conducted, including upgrade of the motor control center, the control panel, telemetry, and alarming system. Ramsey Run was designed so that the same off-the-shelf equipment could be used to replace equipment at both the Ramsey Run and the Pleasant View Pumping Stations.

Robertshaw – Indiana University of Pennsylvania Sewer Replacement Project
This is among the more recent projects, involving upgrade to Authority standards to permit adoption of the orphan sewer on the University campus. The project was primarily funded through the successful application for grant funding prepared by Skelly and Loy and administered by the Indiana County Planning Department, at total project costs of approximately $300,000. This project was primarily funded through the successful application for grant funding.

Conewago Industrial Park Wastewater Treatment System Expansion
Elizabethtown, Lancaster County, Pennsylvania

Client/Owner
Conewago Industrial Park Water and Sewer Company

Estimated Project Value
Total: $2,700,000
Firm Responsibility: $2,700,000

Completion Date
October 2015

Key Components
Wastewater Treatment System Design; Wastewater Treatment System Construction; Wastewater Treatment System Start-up Services

Reference Contact
Mr. Martin Murray
P.O. Box 332
Lemoyne, PA 17043
P: 717-766-3000

When the Conewago Industrial Park Sewer and Water Company (CIP) reached an agreement with Nordstrom, Inc., that would lead to construction of a new 672,000 square foot warehouse facility employing a peak projection of 700 full-time workers, it became clear that a major improvement would be required in advance of a planned late Spring 2015 occupancy. The existing CIP wastewater treatment system, constructed in the 1970's, was quickly approaching its treatment capacity and discharge level limits. Estimated sewage loads for the new facility and anticipated future growth elsewhere in the park led CIP to commit to a treatment plant upgrade.

The owner of the CIP wastewater treatment system engaged Skelly and Loy and its wholly-owned AMS of Skelly and Loy construction subsidiary to design the required upgrades and prepare the applications required for permitting of upgrade and expansion of the existing sewage treatment plant serving the park's business residents, then build the resulting project. The $2.7 million project more than doubled the plant's peak treatment capacity to 150,000 gallons per day. Additionally, chronic solids settling problems associated with the original plant were corrected and discharge water quality has been significantly improved.

Design began with a review of Pennsylvania Department of Environmental Protection-mandated discharge limits and an evaluation of nutrient removal requirements, followed by evaluation of several potential treatment system upgrade options. Ability to meet discharge quality limits, ease of operation, capital cost, operations and maintenance costs, and likely regulatory acceptance were considered, resulting in a recommendation to employ a new sequencing batch reactor (SBR) system while converting existing treatment units for future sludge handling. With DEP's approval, Skelly and Loy proceeded with final design and local building permit application preparation.

With permits in hand, the AMS team finalized the construction cost and, in its role as general contractor, began installation. In-house AMS personnel performed all the site preparation and excavation work, treatment equipment installation, piping fabrication and installation and other general site work, with pre-fabricated concrete tank fabrication and installation and electrical systems installation performed by subcontractors.

Although facility construction began in July 2014 immediately upon receipt of the DEP construction permit, the winter's extended below-freezing temperatures and frequent precipitation resulted in challenging working conditions that threatened to extend the overall project schedule significantly. Yet start-up of the upgraded treatment system was still achieved in May 2015, just in time for the opening of the new Nordstrom facility. Following start-up, the existing treatment tank was retro-fitted to serve as a sludge processing tank. All additional site restoration and landscaping work was completed by October 2015.

Conewago Industrial Park Wastewater Treatment System Expansion

Sandhill Pump Station Improvements, City of Lebanon Authority
Lebanon, Pennsylvania

Client/Owner
City of Lebanon

Estimated Project Value
Total: $100,000
Firm Responsibility: $50,000

Completion Date
March 2007

Key Components
Construction of Sandhill Pump Station Improvements

Reference Contact
Mr. Ron Luciotti
400 South 18th Street
Lebanon, PA 17042
P: 717-865-2191

The City of Lebanon Authority provides approximately 250,000 people with municipal sewer service in Lebanon County Pennsylvania. The Authority needed to upgrade the aging Sandhill pumping station to increase capacity and ensure safe and reliable operations.

AMS of Skelly and Loy, Inc. (AMS) was awarded the contract to perform the pumping station upgrades. The work effort included demolition of two old pumping systems and the installation of new systems. AMS performed the general construction work including plumbing, mechanical, electrical, and concrete construction. The old 6-inch ductile iron piping was removed from the pumping station and replaced with new piping. The old concrete pump pads were retrofitted to accommodate two new 15-horsepower (hp) pumps. A new 12-hp motor was installed on a third pump. The project was successfully completed on time and within budget, and the pumping station continues to operate reliably.

With offices in: Harrisburg, PA • Pittsburgh, PA • State College, PA • Hagerstown, MD • Hunt Valley, MD • Morgantown, WV
skellyloy@skellyloy.com • www.skellyloy.com

Maintenance Activities, Construction of Bypass System, and Repair of Equalization Tank at the Exelon Nuclear Power Station Wastewater Treatment Plant Peach Bottom Township, Delta, York County, Pennsylvania

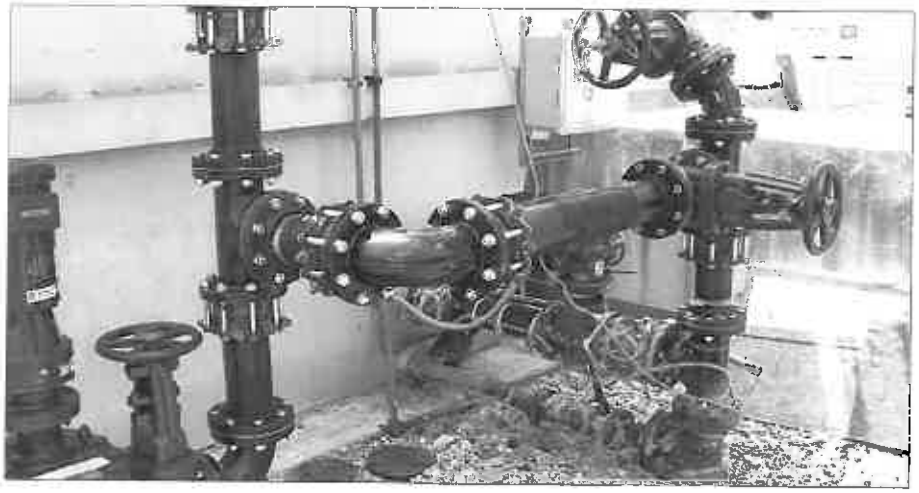
Client
Exelon Generation Company

Estimated Project Value
Bypass Project: $245,000
Maintenance (since 2005): $314,000

Completion Date
Bypass Project: October 2010
Maintenance: Ongoing

Key Components
Wastewater Treatment Plant Maintenance, Installation of Bypass System, Repair of Equalization Tank

Reference Contact
Mr. Joseph Brozonis, P.E.
Senior Environmental Chemist
Exelon Generation Company
Peach Bottom Atomic Power Station
1848 Lay Road
Delta, PA 17314
P: 717-456-3795



AMS of Skelly and Loy, Inc. (AMS) has performed various maintenance activities at Exelon's Peach Bottom Atomic Power Station wastewater treatment plant since 2000, including the inspection, repair, and replacement of pumps, gauges, sensors, chemical feed units, piping, and other components. In conjunction with these efforts, it was determined that the existing steel equalization (EQ) tank at the plant was in need of internal structural repairs and repainting. After discussing repair or replacement options with Skelly and Loy personnel, Exelon contracted with AMS to perform the tank repairs in the summer of 2010. The work had to be performed during warm, dry summer weather but completed prior to the outage of the plant reactors for refueling.

The first phase of the project was the engineering design, permitting, and installation of bypass piping and a comminutor in order to reroute wastewater around the EQ tank. AMS, working in conjunction with Skelly and Loy's Environmental Engineering Service Group, obtained the required Pennsylvania Department of Environmental Protection permit and installed the bypass piping and grinder unit. The bypass piping and comminutor installation was completed on schedule, successfully tested, and put into service. Following installation and startup, AMS worked with a local subcontractor to insulate the new bypass piping and appurtenances in preparation for the winter.

After pumping, cleaning, and initial shotblasting of the EQ tank, it was discovered that more intensive repairs of the internal metal supports would be required prior to final blasting and repainting of the tank. AMS quickly coordinated with the client, a painting subcontractor, and a local welding fabrication shop and assembled an experienced work crew to complete the additional repairs. The painting subcontractor was able to remobilize to another job site in the area while the tank was being repaired. Repairs were successfully completed, and the tank was painted, tested, and put back into service in time for the outage, which resulted in a very pleased client.

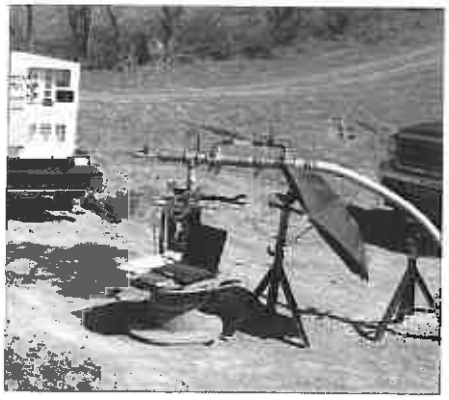
Maintenance Activities, Construction of Bypass System, and Repair of Equalization Tank

Arch Rock Subdivision Groundwater Supply Development
Fermanagh Township, Juniata County, Pennsylvania

Client
John E. Groninger, Inc.

Project Value
Total: $501,300

Key Components
Groundwater Supply Assessment; Site Hydrogeology Examination; Aquifer Testing; Permitting; Supply Well Installation; Potable Water Treatment System Design; Land Development Design; Wastewater Systems Design and Installation; Construction Inspection and Certification



Skelly and Loy, Inc. was retained by John E. Groninger, Inc. to perform land development design; design potable water source, treatment, storage and distribution systems as well as wastewater collection and treatment systems to serve an area adjacent to the Arch Rock exit of U.S. Routes 22 and 322. These systems were needed to serve 89 apartment and townhome residences as well as two existing commercial buildings and a future commercial establishment.

Land development task included the layout of 6 apartment buildings as well as the associated access roads and parking areas. The layout needed to meet zoning and land development ordinances, while maintaining the required well head protection for the two water supply wells for the development. Stormwater management was critical for this project. Design of the water service piping and wastewater sewers for this development were also included in this task.

Potable water tasks on this project include the evaluation of current and projected water demands, examination of the site hydrogeology for meeting future anticipated demand, installation of two new source supply wells, aquifer testing, design of system treatment consisting of chlorination, and design of system water storage and distribution systems.

Skelly and Loy prepared the detailed design drawings and specifications for the installation of the potable water treatment, storage and distribution system. Due to the excellent quality of the ground water source for this development, the only treatment required was disinfection. A 100,000 gallon glass lined metal storage tank was selected for finished water storage at this site. A looped distribution system was installed to serve all existing and proposed development. The Public Water Supply permit application and associated modules were prepared and submitted to the Pennsylvania Department of Environmental Protection (PA DEP) for approval. Construction inspection and certification was also performed.

Wastewater tasks on this project began with the development of projected sewage quality and quantity estimates for the proposed development and the preparation and submission of the sewage planning modules to the township and the PA DEP. Upon planning approval, the NPDES discharge permit application was prepared and submitted to PA DEP for the determination of preliminary discharge limits. With limits in hand, the detailed design including plans and specifications were prepared for a 40,000 gallon per day treatment system. The treatment system permit application package including the Design Engineer's Report and the modules was prepared and submitted to PA DEP for approval. Construction inspection and certification was also performed.

Skelly and Loy was selected to install the wastewater treatment plant tanks, components, controls, and sensors in a design build capacity. Skelly and Loy also provides certified operations for this wastewater treatment system.

With offices in: Harrisburg, PA Pittsburgh, PA State College, PA Hagerstown, MD Hunt Valley, MD Morgantown, WV
skellyloy@skellyloy.com www.skellyloy.com

REFERENCES

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Mr. Milt Lady
Township Manager
White Township, Indiana County, Pennsylvania
950 Indian Springs Road
Indiana, Pennsylvania 15701-3506
Contact: 724-463-8585 (Township Offices)

Mr. Martin Murray
Conewago Industrial Park Water and Sewer Company
P.O. Box 332
Lemoyne, Pennsylvania 17043
P: 717-766-3000

D. F. Staley, Independent Contractor
Mr. Paul Phillips
Sewage Enforcement Officer
White Township, Indiana County, Pennsylvania
950 Indian Springs Road
Indiana, Pennsylvania 15701-3506
Contact: 724-463-8585 (Township Offices)

Triad Engineering, Inc.

Mr. Rich Perin
CONSOL Energy/Mon View Development
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Mr. Marty Mariotti
General Manager
Green Valley-Glenwood PSD
Post Office Box 6099
Bluefield, West Virginia 24701
Contact: 304-325-6832

Mr. Lucas Gagnon, P.E.
President
Moorefield/Hardy County Wastewater Authority
206 Winchester Avenue
Moorefield, West Virginia 26836 Contact: 304-530-6142

Allegheny Design Services

Mr. John Sommers
West Virginia University
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Morgantown, West Virginia 26506-6572
Contact: 304-293-2856

Mr. Brian Johnson
Bright Enterprises
300 Greenbrier Road
Summersville, West Virginia 26651
Contact: 304-872-3000

Orenco®

June 10, 2016

Mark Pitterle, PhD
Skelly & Loy, Inc.
3280 William Pitt Way
Pittsburgh, PA 15238

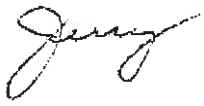
Dear Mark,

Thank you for including us as you review opportunities at Watoga and Pipestem Parks for the West Virginia Department of Natural Resources.

As in the past, we at Orenco would be pleased to be a member of your support team for these projects if you are selected as the design engineer. Orenco has a long history of working with Skelly and Loy staff, and we are looking forward to continuing this working relationship. Wes Anderson and I will contribute all that we can to ensure the client receives the most value possible, for both capital expense and operational costs well into the future.

I look forward to working with all of you on another project, and await your direction.

Very Best Regards,



Jerry VanAuker
Area Sales Manager
Orenco Municiapal Sewers Group

AdvanTex® Treatment Systems

AX-Max™

Manufactured by **Orenco Systems®, Inc.**

This full-sized AdvanTex® AX-Max™ wastewater system was installed at a 50-site campground in the LaPine State Park, LaPine, Oregon, to handle design flows of 7,500 gpd (28.4 m³/day).

Decentralized Wastewater Treatment for Commercial Properties and Communities

Applications:

- Municipal systems
- Subdivisions, apartments
- Golf course developments, resorts
- Manufactured home parks
- Parks, RV parks, campgrounds
- Schools, churches, businesses
- Rest areas, truck stops

Orenco Systems®, Inc.
814 Airway Avenue, Sutherlin, Oregon, USA 97479
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AdvanTex® AX-Max™ Treatment System

Reliable, Energy-Efficient Wastewater Treatment Everywhere!

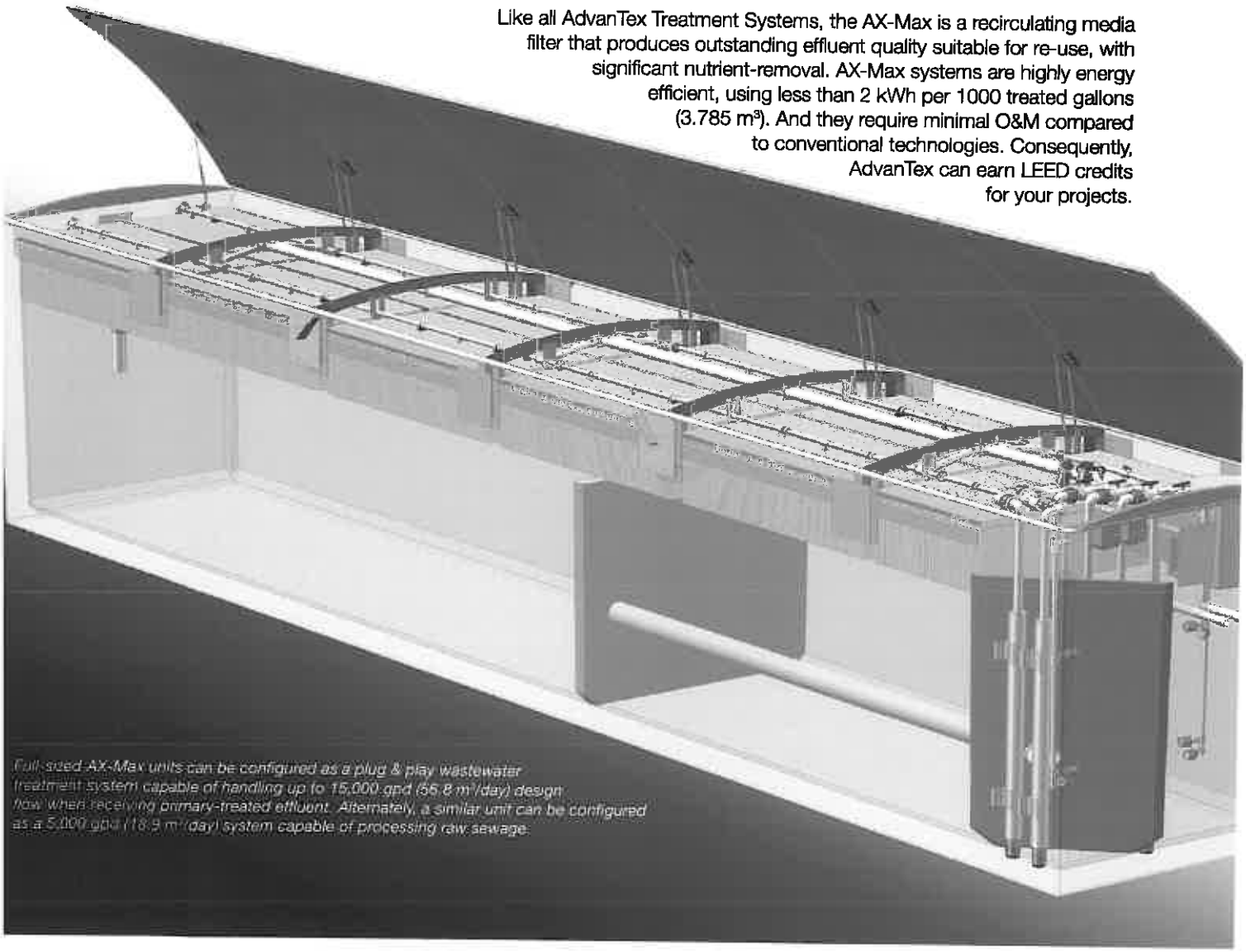
The Yakama Nations Housing Authority in Washington state added five AdvanTex® AX-Max units (background) to its ten AdvanTex AX-100 units, increasing the capacity of its wastewater system by 50%. Photo courtesy of Fextex Systems, Inc.

For nearly 15 years, Orenco's AdvanTex® Treatment Systems have been providing reliable, energy-efficient wastewater treatment inside and outside the urban core. AdvanTex textile filter technology has been winning awards and coming out on top in field trials and demo projects, all over the world.

Orenco's newest product in the AdvanTex line is the AX-Max™: a completely-integrated, fully-plumbed, and compact wastewater treatment plant that's ideal for commercial properties and communities. It's also ideal for projects with strict discharge limits, limited budgets, and part-time operators.

A Sustainable Solution for Wastewater Treatment

Like all AdvanTex Treatment Systems, the AX-Max is a recirculating media filter that produces outstanding effluent quality suitable for re-use, with significant nutrient-removal. AX-Max systems are highly energy efficient, using less than 2 kWh per 1000 treated gallons (3.785 m^3). And they require minimal O&M compared to conventional technologies. Consequently, AdvanTex can earn LEED credits for your projects.



Full-sized AX-Max units can be configured as a plug & play wastewater treatment system capable of handling up to 15,000 gpd (56.8 m^3/day) design flow when receiving primary-treated effluent. Alternately, a similar unit can be configured as a 5,000 gpd (18.9 m^3/day) system capable of processing raw sewage.

AdvanTex® AX-Max™ Treatment System

Units range from 14'-42' in length.
This 21' unit is ideal for lower flows.

Set, Plumb, Wire, and Go

The AX-Max is pre-plumbed and easy to install, so AX-Max projects can meet the tightest deadlines. The entire system — including treatment, recirculation, and discharge — is built inside an insulated fiberglass tank that ranges from 14'-42' (4.3-12.8 m) in length. AX-Max's can be installed above-ground — for maximum versatility in temporary or variable-flow situations — or in-ground. They can also be installed individually or in multi-tank arrays, treating up to 1 MGD (3,800 m³/day).

For Every Climate and Condition

AX-Max systems provide excellent treatment anywhere, and they have been installed all over the world. For example, AX-Max systems have been installed in-ground at Malibu's famous beach parks, the Boy Scout's National Jamboree site in West Virginia, and New Zealand's resort at Glendhu Bay. Two more were recently installed in-ground in Soyo, Africa, to serve a new hospital. Other AX-Max systems have been installed above-ground on top of Alaska's frozen tundra and St. Lucia's volcanic rock. Still more have been installed above-ground in mining camps from Alberta to Texas and, in the Midwest, at a U.S. Department of Defense demo site.

Benefits

- [illegible]
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- Easy to set
- Simple to operate
- [illegible]

Textile Treatment Media

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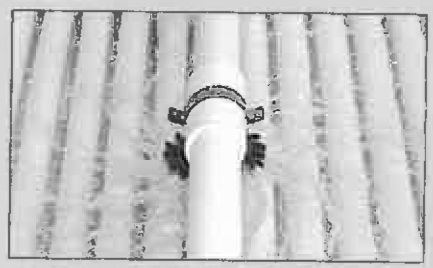

Effluent Distribution

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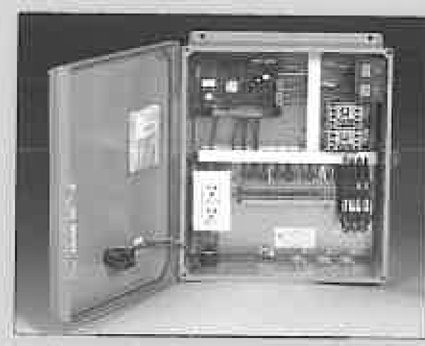

Telemetry Controls

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AdvanTex® AX-Max™ Treatment System

Carefully Engineered by Orenco

Orenco Systems has been researching, designing, manufacturing, and selling leading-edge products for small-scale wastewater treatment systems since 1981. The company has grown to become an industry leader, with about 250 employees and 300 points of distribution in North America, Australasia, Europe, Africa, and Southwest Asia. Our systems have been installed in more than 60 countries around the world.

Orenco maintains an environmental lab and employs dozens of civil, electrical, mechanical, and manufacturing engineers, as well as wastewater treatment system operators. Orenco's technologies are based on sound scientific principles of chemistry, biology, mechanical structure, and hydraulics. As a result, our research appears in numerous publications and our engineers are regularly asked to give workshops and trainings.

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Orenco Systems®, Incorporated

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Project Summary

Point Dume State Beach and Preserve, Southern California

In spring, 2011, Los Angeles County needed to quickly upgrade restrooms at Malibu's Point Dume State Beach in time for the long — and busy — Memorial Day weekend. The county's engineer specified three AX-Max's, one for each restroom, and the units were installed in a matter of days. Each unit was custom-painted to blend into the surrounding sand or asphalt. After disinfection, the treated effluent is dispersed right into the sand. Point Dume is part of a large-scale upgrade of L.A. County beach parks, virtually all of which include AdvanTex Treatment Systems of various sizes and configurations.

Fully Supported by Orenco

AdvanTex Treatment Systems are part of a comprehensive program that includes ...

- Designer, installer, and operator training
- Design assistance, technical specifications, and plan reviews
- Installation and operation manuals
- Lifetime technical support

Distributed by:

CUSTOM SOLUTIONS FOR

Campgrounds & RV Parks

Wastewater Solutions

Affordable Wastewater Treatment Solutions from Orenco Systems®, Inc.

Designing wastewater systems for campgrounds and RV parks is challenging. After all, what kind of a system can offer the process stability to treat the high-strength wastewater that surges through the system during good weather and slows to a trickle during bad weather? Orenco's packed bed filter treatment systems have been successfully handling campground flows for decades, at more than 250 seasonal facilities around the world: campgrounds and RV parks, but also visitors' centers and freeway rest stops.

In stunning Monument Valley, the Navajo Nation operates a hotel and restaurant. When they wanted to add camping facilities as well, an AdvanTex® treatment system made it possible.

The View Campground, Arizona

AdvanTex® units accommodate growth

In beautiful Monument Valley, Arizona, the Navajo Nation wanted to expand its tourism facilities to include a campground area, cabins, and an RV park. In addition, they needed help for their current wastewater system — not manufactured by Orenco — which was struggling to keep up with flows from the existing hotel and restaurant. The Nation chose to install four AdvanTex® AX-Max units followed by soil trench dispersal.

The treatment units were supplied by Premier Environmental Products and installed by Integrated Water Services. Start-up was in June, 2014, just in time for the busy summer travel season. The new AX-Max units share a collection system with the older WWTS, an anaerobic-aerobic sequence bioreactor. A diversion point was added just in front of the older system so that about two-thirds of the total flow is now directed to the newer system. The AdvanTex units have the capacity for an average daily flow of roughly 20,000 gpd (75.7 m^3/day), and additional units can easily be added to accommodate future growth.

Design Considerations for CAMPGROUNDS & RV PARKS

Campgrounds and RV parks experience dramatic fluctuations in wastewater flow. They also tend to generate higher-strength waste than other facilities, because when people camp out, they do a lot less washing but just as much flushing. In addition, by their very nature, campsites are often located in remote areas, where operators are not always readily available.

Orenco's AdvanTex® Treatment Systems employ a multi-pass, packed bed filter technology that is ideal for handling highly variable flows and is also inherently more stable than suspended-growth activated sludge systems. A more stable process means greater reliability, lower operation and maintenance requirements, and greater confidence in meeting the permit limits for these beautiful places.

Orenco's AdvanTex Design Criteria includes a sample design for campground applications. To order a copy, call 800-348-9843 or +1 541-459-4449.

Continued on next page

The refurbishment of Camp Fircom featured not only a new AdvanTex wastewater system, but also a dining hall designed by Principle Architecture. Photo courtesy of Camp Fircom.

Camp Fircom, British Colombia

Low power consumption a necessity

Camp Fircom, located on British Colombia's Gambier Island, got its start in the 1920's, with campers arriving by rowboat and sleeping under tents in open fields. The camp grew slowly, eventually adding a dining hall and various smaller structures. By 2005, major renovations were called for, including a new wastewater system.

Because the camp needed to generate its own electricity, energy efficiency was paramount. The designer chose to install three AdvanTex AX100s to accommodate average daily flows of up to 9,700 gpd (36.7 m^3/day). The low maintenance requirements and low power consumption (< 2 kWh per 1000 treated gallons or 3.8 m^3) of the AX100s made them a particularly good fit.

Oak Bottom Marina Campground, California

AdvanTex replaces struggling batch reactor

Just west of Redding, California, Oak Bottom Marina Campground attracts thousands of people each summer, with holiday weekends being the busiest. But the campground's wastewater system was struggling to keep up, and its aeration batch reactor required manual testing and adjusting, daily. The decision was made to upgrade the wastewater plant with a low-maintenance system that had a smaller footprint: an AdvanTex Treatment System.

In service since 2014, the new system uses an older, existing lift station to pump wastewater to a 20,000-gallon (75.7-m^3) primary treatment tank. From there, the waste flows by gravity to a pair of 6,500-gallon (24.6-m^3) equalization tanks and then to a timed-dose lift station where a predetermined and adjustable amount of wastewater is pumped into an AX-Max unit for secondary treatment. Effluent is then pumped through a chemical feed system for pathogen removal and finally to a one million-gallon (3,785-m^3) storage tank that holds the treated effluent for forest dispersal during the summer months.

Over 100 AdvanTex AX-RTs at the BSA's national "Jamboree" site treat greywater from sinks and showers for reuse in toilets. Photo courtesy of Tim Felbinger.

The Summit, West Virginia

Treating greywater for reuse saves resources

The Summit in West Virginia is the permanent location of the National Scout Jamboree, a monumental gathering every four years of approximately 45,000 Boy Scouts, leaders, and support staff. At other times, this 15,000-acre (6,070-ha) property serves as one of the Scouts' "high adventure bases," hosting youth and adults throughout the summer months, and occasionally in the winter.

In keeping with the principles of Scouting, the organization desired an environmentally friendly method for disposing of greywater generated at The Summit. Orenco's AdvanTex textile filters fit the bill. An army of AdvanTex AX-RTs — 110 altogether — was installed to process the water from The Summit's 117 shower facilities and treat it for re-use in toilets. This greywater system saves the camp up to 200,000 gallons (757 m^3) per day during periods of high usage.

Spring Hill RV Park, Alberta

Owners save money with new WWTP

Spring Hill RV Park in Cochrane, Alberta boasts everything a motor home owner is looking for: large sites with adjacent fire pits, laundry and shower facilities, Wi-Fi access — even a convenience store and gas station. However, the owners were paying several thousand dollars per month to have wastewater trucked out for treatment.

In the spring of 2014, they installed an AdvanTex AX-Max unit, which now treats up to 6,600 gpd (25 m^3/day) of wastewater on-site. With an AX-Max, the entire system — treatment, recirculation, and discharge — is built inside an insulated fiberglass tank, so installation is simplified. Because of the savings in trucking fees, the system will have paid for itself in just four years, including installation charges and the cost of the drainfield, aeration tank, and permit fees.

Orenco®