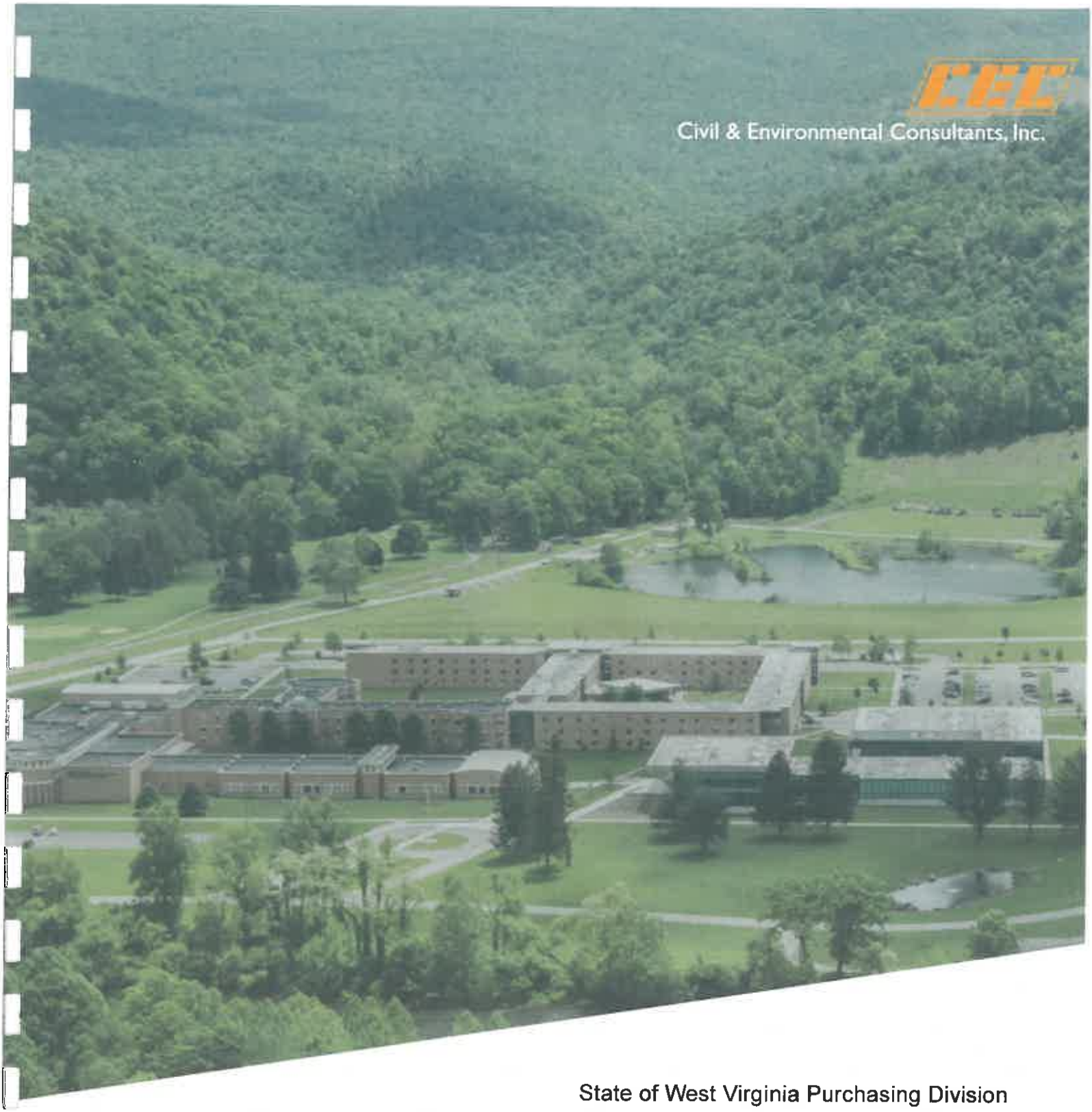

State of West Virginia Purchasing Division

CAMP DAWSON PIERCE LAKE DAM REPAIR DESIGN
CEOI 0603 ADJ20000000010

CEC | Bridgeport
Project 302-530
May 14, 2020

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APPENDICES

This page has been inserted to accommodate two-sided printing.

1.0 Firm Overview

In 1989, four engineers and scientists came together with a singular vision: to be a people-first company, one that promotes a culture where clients and employees enjoy working together, and that is responsive to client needs with integrated services and high-quality work for projects both complex and routine.

More than 30 years later, Civil & Environmental Consultants, Inc. (CEC) has 1,000+ team members in offices nationwide. Headquartered in Pittsburgh, Pennsylvania, we are consistently ranked on *Engineering News-Record*'s annual lists of the Top Design Firms and Top Environmental Firms in the nation.

A culture of accountability. We own it.
At CEC, every member of our team has a personal stake in ensuring the success of our clients. Because their success is our success. As employee-owners of the firm, we are all personally accountable for building lasting relationships and delivering outstanding results. Because we don't just work at CEC. We own it.

Being easy to work with. We own it.
At other firms, you may find one person you work well with. Here, our clients tell us they work well with all of us. It's because all of us are invested in your success. We're accessible, responsive, and operate with integrity.

Putting people first. We own it.
At CEC, people come first. Always. Whether that's our clients, our employees, or our community. It's why we listen more and work harder to understand the unique needs of our clients. And it's why we prioritize the career development of every individual on our team. People are why we do this, and why we love what we do.

Teamwork. We own it.
We are at our best when we work together. That means bringing together a diverse team of talented, passionate, multidisciplinary experts to work closely alongside clients to craft comprehensive solutions to complex problems. We believe that by working together, no problem is insurmountable.

Safety excellence. We own it.
We believe all accidents are preventable and are committed to creating an accident- and incident-free workplace for employees and subcontractors through training, safe workplace practices, and processes for assessing project hazards. CEC strives for safety excellence throughout our entire organization and holds all individuals accountable for the safe performance of their work.

CEC is an expanding, multi-disciplined company that is home to:

- Civil Engineers
- Geotechnical Engineers
- Transportation Engineers
- Structural Engineers
- Environmental Scientists
- Environmental Engineers
- Chemical Engineers
- Geologists
- Hydrogeologists
- Hydrologists
- Ecologists
- Biologists
- Wetland Scientists
- Threatened & Endangered Species Experts
- Agronomists/Soil Scientists
- Emissions Testing Professionals
- Chemists
- Archaeologists
- Construction Managers and Inspectors
- Environmental Technicians
- Treatment Plant Operators
- Land Surveyors
- Landscape Architects
- GIS Analysts and Programmers

WHAT WE DO & WHERE WE ARE.

PRACTICES

- Air Quality
- Civil Engineering
- Ecological Sciences
- Environmental Engineering and Sciences
- Manufacturing Infrastructure Services
- Survey/Geospatial
- Waste Management
- Water Resources

MARKETS

- Manufacturing
- Mining
- Oil & Gas
- Power
- Public Sector
- Real Estate
- Solid Waste

Athens, PA
877.389.1852

Austin, TX
512.439.0400

Boston, MA
866.312.2024

Bridgeport, WV
855.488.9539

Buffalo, NY
716.930.6080

Charlotte, NC
855.859.9932

Chicago, IL
877.963.6026

Cincinnati, OH
800.759.5614

Cleveland, OH
800.365.2324

Columbus, OH
888.598.6808

Greenville, SC
855.574.4331

Houston, TX
800.365.2324

Indianapolis, IN
877.746.0749

Kansas City, KS
866.250.3679

Knoxville, TN
865.977.9997

Monroeville, PA
800.899.3610

Nashville, TN
800.763.2326

Oklahoma City, OK
405.246.9411

Philadelphia, PA
888.267.7891

Phoenix, AZ
877.231.2324

Pittsburgh, PA
800.365.2324

St. Louis, MO
866.250.3679

Toledo, OH
855.274.2324

2.0 Approach and Methodology

4.1
CEC's main focus for this project will be to determine the cause of the leaking dam wall and engineer a sustainable repair to the dam. CEC will provide final construction plans, necessary permits and construction bid documents to the West Virginia State Purchasing office for the purpose of bidding and awarding the construction work.

4.2
CEC will also evaluate the existing drainage structure and determine the proper method of repair or replacement for the structure to handle the proper stormwater flows. This will involve the analysis of the drainage area the supplies the lake and determining the proper engineering design for the repair or upgrade of the existing structure.

4.3
CEC will conduct a utility locate for the area surrounding the Pierce Lake Dam and survey all located aboveground and subsurface utilities as part of this project. Any located utilities that will require relocation or modification as part of the engineered solution, will be included with the final construction plans.

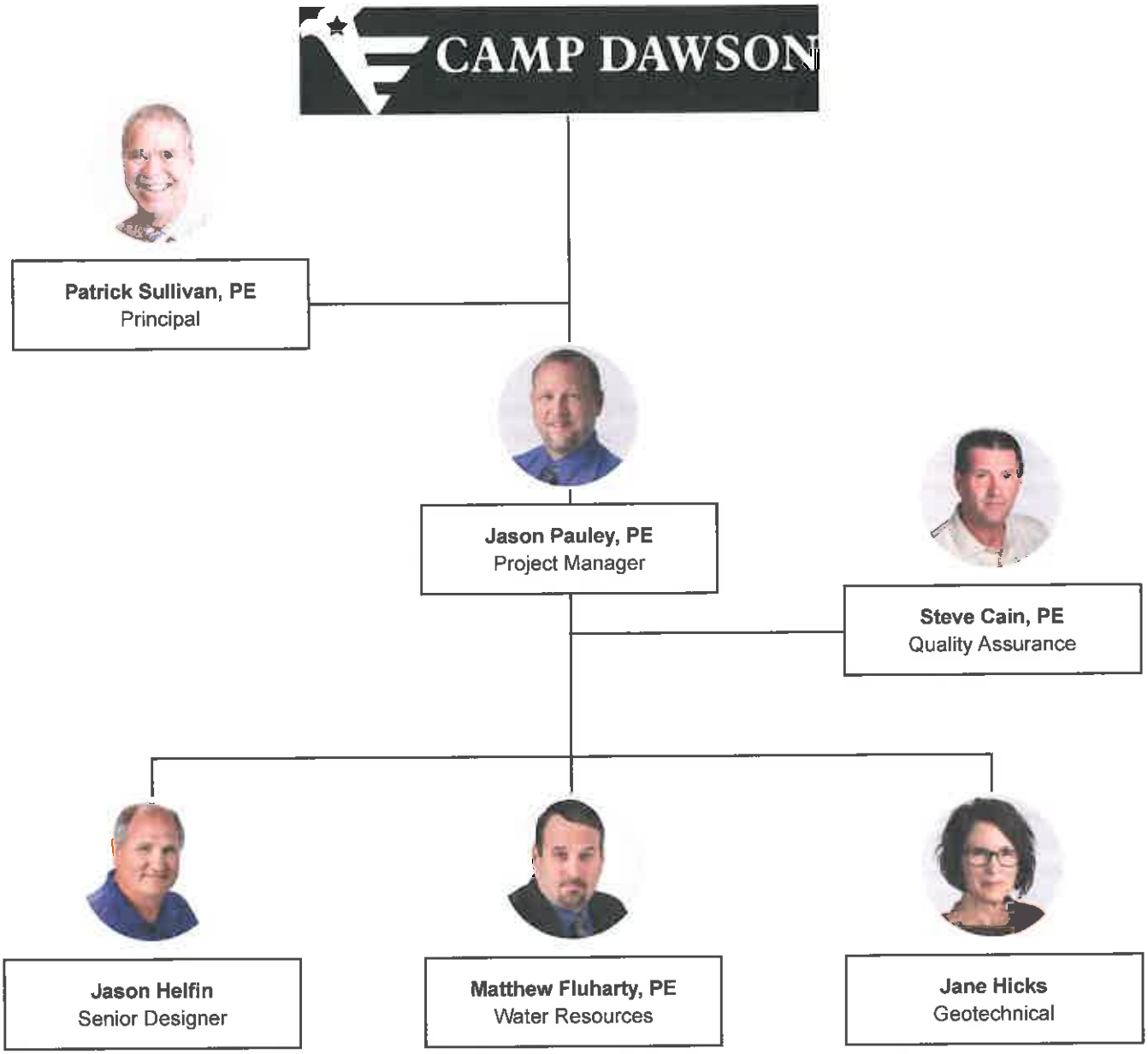
4.4
CEC will coordinate and oversee all necessary exploratory drilling and sampling operations. CEC will also provide boring maps and geotechnical reports for all geotechnical studies.

4.5
CEC will submit construction drawings and specifications throughout the design process at 35%, 65%, 95% and 100% levels of completion. These will all be submitted digitally with the exception of the 100% complete plans being submitted both digitally and three (3) full size hard copies. Cost estimates will be provided with each submission for the 35%, 65%, 95% and 100% construction plans and specifications.

4.6
CEC will assist West Virginia State Purchasing throughout the bidding and awarding of the project. CEC will attend all mandatory pre-bid and bid meetings to assist with answering questions for the bidding contractors.

A detailed approach can be found in Appendix A - CEC Dam Strategy

3.0 Project Team



Patrick J. Sullivan, P.E.
Principal

37 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering, University of Pittsburgh, 1983

REGISTRATIONS

Professional Engineer
- PA [redacted]
- OH [redacted]
- WV [redacted]
- WA [redacted]
- IA [redacted]
- KS [redacted]
- TN [redacted]

Mr. Sullivan is a Principal with 37 years of consulting experience and significant federal government project and regulatory experience. He has managed numerous geotechnical, environmental and civil engineering projects in both the private and public sector.

He specializes in the management and design of said projects and the quality assurance responsibilities associated with construction. Responsibilities included: the generation or checking of various calculations, the development of project specific documents such as work plans, construction quality assurance plans, reports, narratives, cost estimates and bid documents, and the preparation or review of construction drawings and technical specifications in client requested or standardized formats.

He possesses experience in the USACE's specialized design/phasing process having participated in value engineering workshops and BCOE conferences and having prepared DDR and P&S deliverables at the various percentage submissions stages. He also has utilized DrChecks, SpecsIntact and MCACES software programs used by USACE.

Mr. Sullivan has expertise in areas such as abandoned mine land reclamation, foundation analysis and design, coal refuse and slurry impoundment design and analysis, pavement design, architectural drafting, and surveying. His environmental background has allowed him to perform remedial designs for hazardous waste and solid waste landfills and surface impoundments, and prepare remedial investigation reports and feasibility studies in both the private and public-sector arenas.

PROJECT EXPERIENCE

Labyrinth Replacement Project, Washington Dam No. 3, CONSOL Energy, Inc., Washington, PA

Project Manager and geotechnical engineer for the design of a labyrinth weir, chute and stilling basin to replace an inadequately sized and deteriorated structure at an existing reservoir and embankment in North Franklin Township, PA. In 2011, CONSOL Energy, Inc. (CONSOL) acquired Dam No. 3 in Washington County, PA to utilize the water for future mining and gas needs. The earthen dam was constructed in the mid 1890's and is 48 feet high and 950 feet long. In the 1920's, the earthen dam was raised 13 feet and a 50 feet wide concrete ogee weir, spillway chute and stilling basin were constructed to address discharge of stormwater. The dam is inspected annually, in accordance with PADEP regulations and maintains a B-1 classification, which require the spillway system to handle the discharge associated with a Probable Maximum Flood (PMF). Mr. Sullivan supervised a subsurface investigation consisting of the collection of soil and rock samples to fill data gaps within existing geotechnical data and to locate the Washington coal seam, which outcrops within the reservoir and beneath the spillway chute and performed several site reconnaissance. Following the investigation and preparation of the geotechnical report, Mr. Sullivan supervised the hydraulic design of the labyrinth, chute and stilling basin, which established wall heights, spillway length, cycle spacing, head and 100 year and PMF discharge (450 and 11,000 cfs). He then supervised design to remove the existing spillway, chute and stilling basin and design the new spillway, which included a reinforced concrete labyrinth foundation slab and walls, abutment and tie-in walls, a subsurface cutoff wall, topping slab, spillway chute and stilling basin. Riprap protection and excavation, grading and fill placement around the completed concrete structure were also prepared. Mr. Sullivan oversaw the design calculation process and the preparation of 47 civil, geotechnical and structural plans, sections and detail drawings, technical specifications; an engineer's cost estimate and a construction schedule. He prepared the Design Report for PADEP that included design criteria, basis for design, hydraulic and hydrologic data, geotechnical data, and evolution of the design from preliminary to final submittal. The Design Report

was needed to obtain a 'Letter of Amendment' (LOA) approval from PADEP, which allows changes to be made to a dam if an existing permit for a dam is in good standing, and the top of dam and normal pool elevation are not being modified. Comments on the design received from PADEP resulted in the following design modifications: -Additional stability analysis using consolidated drained and undrained triaxial shear strength testing, with samples obtained from additional investigation; -Installation of Vibrating Wire Piezometers to collect potential water elevations; -Replace pervious sub-base material beneath labyrinth with cohesive fill -Use of a dual graded filter granular beneath the spillway chute and stilling basin -Over-excavate to remove coal beneath labyrinth and replace with cohesive fill -Verify structural integrity of labyrinth based on calculated settlement -Extend concrete cutoff wall to top of competent rock and into embankment -Evaluate location of concrete joints and waterstops Mr. Sullivan supervised the development of a General NPDES Permit (PAG-02), an E&S Plan, a PCSM Plan and a Water Drawdown Application for county conservation agencies. The LOA was received from PADEP in November 2014.

Labyrinth Replacement Project, Washington Dam No. 4, CONSOL Energy, Inc., Washington, PA
Project manager and geotechnical engineer for the design of a labyrinth weir, chute and stilling basin to replace an inadequately sized and deteriorated structure at an existing reservoir and embankment in Washington County, PA. In 2011, CONSOL Energy, Inc. (CONSOL) acquired Dam No. 4 in Washington County, PA to utilize the water for future mining and gas needs. The earthen dam was constructed in the mid 1890's and is 68 feet high and 1250 feet long. In the 1920's, the earthen dam was raised 13 feet and a 50 feet wide concrete ogee weir, spillway chute and stilling basin were constructed to address discharge of stormwater. The dam is inspected annually, in accordance with PADEP regulations and maintains a B-1 classification, which require the spillway system to handle the discharge associated with a Probable Maximum Flood (PMF). Mr. Sullivan supervised a subsurface investigation consisting of the collection of soil and rock samples to fill data gaps within existing geotechnical data and to locate the Washington coal seam, which outcrops within the reservoir and beneath the spillway chute and performed several site reconnaissance. Following the investigation and preparation of the geotechnical report, Mr. Sullivan supervised the hydraulic design of the labyrinth, chute and stilling basin, which established wall heights, spillway length, cycle spacing, head and 100 year and PMF discharge (415 and 15,300 cfs). He then supervised design to remove the existing spillway, chute and stilling basin and design the new spillway, which included a reinforced concrete labyrinth foundation slab and walls, abutment and tie-in walls, a subsurface cutoff wall, topping slab, spillway chute and stilling basin. Riprap protection and excavation, grading and fill placement around the completed concrete structure were also prepared. Mr. Sullivan oversaw the design calculation process and the preparation of 32 civil, geotechnical and structural plans, sections and detail drawings, technical specifications; an engineer's cost estimate and a construction schedule. He prepared the Design Report for PADEP that included design criteria, basis for design, hydraulic and hydrologic data, geotechnical data, and evolution of the design from preliminary to final submittal. The Design Report was needed to obtain a 'Letter of Amendment' (LOA) approval from PADEP, which allows changes to be made to a dam if an existing permit for a dam is in good standing, and the top of dam and normal pool elevation are not being modified. The design modifications made to dam No. 3 were incorporated into the design of Dam No. 4, which resulted in minimal comments. The comments received from PADEP resulted in the following design modifications: -Verify structural integrity of labyrinth based on calculated settlement -Evaluate location of concrete joints and waterstops -Use of a dual graded filter granular beneath the spillway chute and stilling basin Mr. Sullivan supervised the development of a General NPDES Permit (PAG-02), an E&S Plan, a PCSM Plan and a Water Drawdown Application for county conservation agencies.

Statewide Dam Safety Services ODNR Division of Engineering, Various Counties, OH
QC Manager for this task-order based contract to perform civil, geotechnical, hydrologic and hydraulic engineering in support of dam safety upgrades for dams owned by the State of Ohio on an as-needed basis. Current services include site assessments with field inspection, seepage, and structural condition, EAPs and OMI Manuals in the new FEMA/ODNR format for 17 Class I dams. Services include, analysis on the existing conditions of the dam and spillway, hydraulics of the existing dams and spillway based on the new statewide probable maximum precipitation data, dam breach analysis, flood routing and inundation mapping including population at risk analysis.

Emsworth Main Channel Dam Rehabilitation, USACE, Pittsburgh, PA
Project Manager and Sr. Civil Engineer for the major rehab at Emsworth Dam on the Ohio River, NW of Pittsburgh. The existing concrete stilling basin apron downstream of the dam does not provide adequate energy dissipation protection for flows through the dam gates and the existing apron erosion protection that consists of derrick stone, sheet piling and grout filled bags has not performed adequately. Severe corrosion of gate truss members at 8 gates has also been identified and the mechanical and electrical operating systems for the dam gates are no longer reliable. Mr. Sullivan attended a conference that developed alternatives for design and construction of the erosion protection system and supervised the preparation of a report selecting the

recommended design approach. He managed the design of grout-bag scour protection, from the downstream apron to the top of rock, apron stabilization and stabilization of an existing concrete abutment wall using king piles and sheet piles. He also supervised esplanade slab design, pier repairs and modifications for new hydraulic lift gates, site laydown and contractor staging areas, machinery building shells that were designed to be lowered over new machinery and secured to new steel floor framing and incorporated gate and disposal area plans and specifications prepared by USACE. Mr. Sullivan coordinated the efforts of 6 subcontractors and 4 Bergmann offices to produce the design submittal. He supervised the development of 120 CADD drawings, full technical specifications, Primavera construction schedule, and a Design Documentation Report. The design was completed in 10 months.

Simco E-104 Sediment Dam, Peabody Coal Company, Coshocton County, OH
Lead project engineer in the design of a sediment embankment structure. The structure was to replace and existing dam located just upstream. Mr. Sullivan designed the embankment and determined the stability using STABL5 software. He also designed the principal and emergency spillways using HC-2 software. He developed construction drawings and prepared technical specifications.

TRAINING

Unlimited Building Examination- ? South Carolina Contracting Licensing Board, February 1998

AWARDS

Iowa Concrete Paving Association, Certificate of Merit, Special Recognition, Unusual Application; Lake Red Rock, Marina Cove Flood Recovery Project, Pella, IA

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers

Society of American Military Engineers

Association of State Dam Safety Officials

American Society of Highway Engineers

PRESENTATIONS

"Birdland Park Levee Systems Improvement Project" United States Army Corps of Engineers Infrastructure Systems Conference June 2011, Atlanta, GA.

"Dam No. 3 Labyrinth Replacement Project" United States Army Corps of Engineers Joint Engineering Training Symposium (JETS) October 2013, Rock Island , IL

"Dam No. 3 Labyrinth Replacement Project" Association of Environmental and Engineering Geologists National Conference September 2014, Phoenix, AZ

"Steep Slope Erosion and Sedimentation Control at a Limestone Mine in West Virginia" Society of Mining Engineers National Conference February 2017, Denver, CO

Jason M. Pauley, P.E.
Project Manager

REGISTRATIONS

Professional Engineer
- WV [redacted]

9 YEARS EXPERIENCE

EDUCATION

B.S., Civil and Environmental Engineering, West Virginia University, 2009

Mr. Pauley is a professional engineer with over 9 years of experience in civil and environmental engineering as well as over 20 years of experience in the United States Army Reserve. He is experienced in several aspects of civil engineering including potable and fresh water system design, hydraulic modeling, freshwater intake design, pump selection and piping systems. The majority of his experience is in permanent and temporary water systems for the energy industry as well as some municipal clients.

Mr. Pauley has prepared and received approval for numerous environmental permits to include West Virginia Bureau for Public Health Permits for municipal water and wastewater projects, West Virginia Department of Environmental Protection Stormwater Construction Permits, United States Army Corps Permits, WV National Pollutant Discharge Elimination System (NPDES) and West Virginia Department of Highways Road Crossing and Encroachment Permits.

In the United States Army Reserve, Mr. Pauley worked on operating fuel transfer and storage systems such as the Inland Pipeline Distribution System (IPDS), Fuel System Supply Point (FSSP) and the Advanced Aviation Forward Aircraft Refueling System (AAFARES) in different environments and terrain. The construction of these systems are extremely similar to the water systems Mr. Pauley currently designs for the natural gas industry.

PROJECT EXPERIENCE

Temporary Water Line Projects, Southwestern Energy SWN, Proctor Wetzel, WV*
Project Manager. Jason provided the client with project management in addition to engineering design for the construction of eight (8) separate water transfer lines. These water transfer lines were critical to maintain delivery of water at 100 BPM to nearby well pads that were conducting hydraulic fracturing of Marcellus Wells. In addition to project management and design Jason also prepared the bid packages, assisted with environmental permitting and DOH permitting, performed the bidding/award process and reviewed daily inspection logs to verify the quality of work performed.

Temporary Fresh and Flowback Water Line Projects, Southwestern Energy, Various Counties, WV
Role: Project Manager
Jason provided the client with project management in addition to engineering design for the construction of sixty-eight (68) separate water transfer lines over three years. These water transfer lines were critical to maintain delivery of fresh, flowback and blended water to nearby well pads that were conducting hydraulic fracturing of Marcellus Wells. In addition to project management and design, Jason also prepared the bid packages, assisted with environmental permitting and DOH permitting, performed the bidding/award process and reviewed daily inspection logs to verify the quality of work performed. Jason also assisted with the development of SWN's current Standard Operating Procedures for both fresh water and flowback water operations for SWN to include pipe and connection specifications.

Ohio River to Pioneer Impoundment Buried Water Line, Antero Resources, Tyler County, WV
Role: Project Manager
Jason provided the client with project management in addition to engineering design for the construction of a 10.1 mile 30" HDPE Buried Water Line network to replace their existing infrastructure. This water line and intake were designed to be capable of delivering over 10 million gallons of water per day to support Antero's operations in Tyler County. In addition to project

management and design, Jason also prepared the bid packages, assisted with environmental permitting and DOH permitting, performed the bidding/award process and reviewed daily inspection logs to verify the quality of work performed. Jason also assisted with design and permitting of two temporary intake locations on the Ohio River and Middle Island Creek including piping schematics and bathymetric studies.

West Fork Intake and Water Line, Antero Resources, Harrison County, WV*
Role: Project Manager
Jason was responsible for finalizing the intake and water line designs, construction permitting, project bid/award and construction oversight for a 3.6 million gallon per day fresh water intake and 5.3 mile 24" HDPE water line connecting to Antero Resources existing 70 plus mile permanent water distribution system. He performed all calculations to ensure both pump size and pipe class were sufficient for the designed amount of flow. He reviewed and maintained daily quantity records for both contractors and approved contractor pay submittals. The project resulted in the successful transfer of water to impoundments and well pads within Antero Resources' West Virginia plays.

Fresh Water Intake and Water Distribution System, Marshall County, WV*
Role: Project Engineer
Jason was responsible for assisting in the design of a fresh water intake capable of delivering up to 4 million gallons per day of fresh water to Marcellus well pads in and around the area of Moundsville. He also assisted in the design and reviewing of the permanent water distribution system attached to the intake to include water line sizing, booster pump location selection, booster pump selection and pipe line classification requirements. Jason also provided the client with a set of operating Piping and Instrumentation Diagrams for each pumping scenario identifying operating pressures at key points along the water line as well as pump operating speeds.
* *Work performed prior to joining CEC*

Steve A. Cain, P.E.
Quality Assurance

REGISTRATIONS

Professional Engineer
- WV [redacted]
- PA [redacted]
- MD [redacted]

27 YEARS EXPERIENCE

EDUCATION

B.S., Engineering Technology - (Civil Emphasis),
Fairmont State University, 1992

Mr. Cain, a professional engineer with CEC, has more than 27 years of experience in civil engineering design and project management.

Steve's experience in civil engineering design encompasses many aspects of civil engineering design including land surveying, mapping, site development, sanitary sewer system design, storm sewer system design, potable water distribution system design and hydraulic modeling. Additionally, Steve also has experience in water treatment system design and rehabilitation as well as wastewater treatment design.

Steve has also spent a large part of his career in managing projects from conception to completion. As a project manager Steve has assisted clients in identifying potential project needs, assisting the client in securing project funds, performed and directed detail design, and participated in and managed construction activities.

PROJECT EXPERIENCE

Water

Stonewood Water System Improvements, City of Stonewood, Stonewood, WV*
Steve was the Project Manager for conducting a water loss study for the City of Stonewood that identified that the unaccounted water loss ranged on average from 15 to 30 percent. The water loss study included the review of the existing system data, acoustical testing, correlation testing, pressure evaluations, evaluation of break reports and review of the billing records. Steve also provided oversight of design for the proposed improvements. The project was designed for the replacement of the 50 year old existing water distribution system throughout the City of Stonewood's residential communities. The construction was completed in 2015.

Jane Lew Water System Improvements, Jane Lew PSD, Lewis County, WV*
Steve was the Project Manager for the design and construction of approximately 11,500 LF of two-inch galvanized waterline including valves, the removal and replacement of 25 existing gate valves, the installation of 17 new gate valves in the existing distribution system, and installation of 13 bypass meters. The project also included the installation of an eight-inch diameter river crossing pipe to replace an existing crossing, the installation of a supervisory control and data acquisition (SCADA) controlled solenoid valve station and booster chlorination station. Additionally, the project included the extension of 1,500 LF of two-inch polyvinyl chloride water line and a 37 GPM booster pump station to provide service to six new customers and included the fencing of the existing 100,000 gallon water storage tank for security purposes.

Fairmont-Mannington Water Main, City of Fairmont, Marion County, WV*
Steve was the Project Manager for the planning, design, and construction inspection of a 13-mile water main extension from the City of Fairmont to serve the City of Mannington. The project included mapping, route surveys utilizing GPS, assistance in obtaining project funding, design of the 13-mile, 12-inch, and 16-inch water main, preparation of specifications, bid and contract documents, right-of-way acquisition, construction surveys, and construction management and inspection services.

Alpine Lake Water System Improvements, ALPUC, Preston County, WV*
Steve was the project engineer for the preliminary design, detailed design, and construction services for a water system improvement project. Improvements to the water system included the design of four booster pump station upgrades, distribution line replacement, and storage tank improvements. The project also included the planning and design of two new source wells and the design and construction of a new potable water treatment facility.

Government

Internal Revenue Service Computing Center, GSA, Keaneysville, WV*
Steve was the Project Designer responsible for the updating of an existing Spill Prevention, Control, and Countermeasure Plan and West Virginia Department of Environmental Protection Underground Injection Permit. Work included field investigation of storm sewers and oil water separators to determine illicit discharge connections and field surveying of existing features to develop base mapping.

United States Custom House, GSA, Philidelphia, PA*
Steve was the Project Designer responsible for the preparation of a Spill Prevention, Control, and Countermeasure Plan and Operation and Management Plan. Work included field investigation of basement sumps, underground storage tanks and discharge points into storm sewers, to determine possible illicit discharge connections, surveying of existing features to development base mapping and the design of secondary containment practices within the building structure.

Water Distribution System Study, AFCENT, Thumrait,Oman*
Steve was part of a team assigned to field investigate the water distribution system at the Thumrait Air Base, Oman, for the U.S. Air Forces Central. The project included an in country field evaluation, assembling a base map of existing system components, preparation of a hydraulic model for determining system deficiencies, and preparing a 60%, 90%, and final report document.

Rehabilitation of Water Intake Structure, National Park Service, Williamsport, WV*
Steve provided project management and engineering design services for a new water intake structure in the Conococheague Creek for the National Park Service's Cushwa Basin, an interpretive historic site, which is part of the Chesapeake and Ohio Canal system. In addition to the water intake structure, this project included the design of a pneumatic backwash system for the water intake screen, a coffer dam for construction, pump station improvements, access road design, storm water design, a precast concrete building with controls for the backwash system, and electrical system upgrades. Additional services included providing a Condition Assessment Report, Cost Estimates, permitting, construction plans and specifications, meeting minutes, and product data cut sheets.

Water Distribution System Improvements, Confidential Government Agency, Winchester, VA*
Steve was the Project Manager for a water distribution system improvements project that included the design of two (2) 388,000 gallon water storage tanks, a 2,000 GPM constant discharge pressure pump station, new vertical turbine high service pumps, approximately 8,000 LF of 12" ductile iron water line, pressure reducing valve stations, and SCADA system improvements. The project also included the inspection and evaluation of the facilities existing raw water line from its raw water intake to the water treatment plant. Additional services included design charrettes, narratives, cost estimates, and permitting.
** Work performed prior to joining CEC*

PROFESSIONAL AFFILIATIONS

Fairmont State University Technology Advisory Board

West Virginia Rural Water Association

American Society of Highway Engineers

Matthew Fluharty, P.E.
Water Resources

20 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering, West Virginia University, 2000

REGISTRATIONS

Professional Engineer
- WV [redacted]
- PA [redacted]
- MD [redacted]
- OH [redacted]

CERTIFICATIONS

10-hour Construction Safety, Occupational Safety & Health Administration

Aggregate Certified Technician, West Virginia Department of Transportation

Certified Compaction Technician, West Virginia Department of Transportation

Certified Concrete Field Testing Technician, West Virginia Department of Transportation

SafeLand USA - Basic Orientation, PEC Safety

Mr. Fluharty has over 20 years of experience in the engineering and consulting industry servicing private commercial and industrial, Oil and Gas, and government sectors. His project practice focus includes design and engineering of fluid hydraulics, hydraulic modeling and treatment systems, Mr. Fluharty's engineering experience includes: detailed engineering including water pipelines and pumping stations, water storage tanks, plant layouts, equipment sizing and selection, hydraulics analysis; plans and specifications for bidding and construction; engineering cost estimating including project control-level budgeting and life-cycle costs; bidding and procurement; project planning and permitting. He has worked with a variety of projects including: wastewater, raw water, produced water, and brine water.

PROJECT EXPERIENCE

Public Utilities - Water and Wastewater

Wastewater System Improvements , Town of Paw Paw, Paw Paw, West Virginia*
Role: Project Manager
Wastewater System Improvements

1.2M Gallon Water Storage Tank Replacement, Kingwood Water Works, Kingwood, WV*
Role: Project Manager
Project involves the replacement of an existing water storage tank with a new 1,200,000 gallon water storage tank and valve vault, and a new 100 GPM constant pressure booster station.

Charles Point Water System, Bridgeport Utility Board, Bridgeport Harrison, WV*
Role: Project Engineer
Water system extension for proposed new development of Charles Pointe and the new United Hospital Center. Project involved the construction of 16" and 12" water line distribution system, two 500,000 gallon water storage tanks, 700 GPM booster pump station, and telemetering system.

Engineer, Clarksburg Water Board, Clarksburg Harrison, WV*
Role: Project Manger
Severed as General Engineer for the Clarksburg Water Board on various projects and tasks. Related projects, Perry Hollow water line extension, Cedar Heights water system improvements, water storage tank rehabilitation, Chestnut Street water line replacement, Farland Avenue River Crossing, VA Park river crossing, Upgrades to electrical generator for 20 MGD water treatment plant, replacement of 8,000 water meters with automatic read

Freemansburg Water Line Extension Project, Lewis County Commission and Lewis County EDA, Lewis County, WV*
Role: Project Manger
Project involved a new 100,000 gallon welded steel water tank and a 100 GPM package water booster pump station, with telemetering.

Southern Lewis County Water Line Extension Project, Lewis County Commission and Lewis County EDA, Lewis County, WV*
Role: Project Manager
Water line extension project involving approximately 42 miles of water line to serve 400 new customers. Project involved two (2) new 100,000 gallon glass-lined bolted steel water tanks and a 200 GPM booster pump station. Project provided water service along Georgetown Road to US RT 119 and served the communities of Walkersville, Ireland, Duffy, and Vandalia.

Wastewater System Upgrade Project, West Virginia DNR - Blackwater Falls State Park, Blackwater Falls State Park
Role: Project Manager
Served as Project Manager for this project. Project consisted of replacement of approximately 2,000 LF of existing a sanity sewer gravity pipe, a new grinder pump station and forcemain, and making improvements to the existing wastewater treatment plant to extend the useful life of the treatment plant. Prepared plans and detailed specifications, assist with bidding and construction support.

Wastewater Treatment Plant Upgrade Project, West Virginia DNR - Tygart Lake State Park, Tygart Lake State Park
Role: Project Manager
Served as Project Manager for this wastewater treatment plant upgrade project. This project involves the replacement of (2) existing package treatment plants, an 8,000 GPD and 20,000 GPD with new package treatment plants with the latest treatment technologies. In addition, this project involves the replacement of (2) existing grinder pump stations with new modern grinder pumps and with new controls. Included are provided detailed plans and specifications assistance with bidding, and construction support.

Water Treatment Plant Upgrades, City of Parsons, Parsons, WV*
Role: Project Engineer
This project involved the replacement of the existing clearwell with a new 500,000 gallon glass lined water storage tank, new backwash pump station, new filter to waste piping, and new plant water pump supply system.

Water Resources
Intake Pump Station for Dam #3, CNX, Washington, PA
Role: Design Engineer
Design of a 3,000 GPM intake pump station. sized screen, water line, concrete wet well, pump selection. Completion of hydraulic model to size pumps and perform hydraulic analysis. Prepared constriction drawings and specifications, construction cost estimates, project bidding, and construction support.

Intake Pump Station for Dam #4, CNX, Washington, PA
Role: Design Engineer
Design of a 3,000 GPM intake pump station. sized screen, water line, concrete wet well, pump selection. Completion of hydraulic model to size pumps and perform hydraulic analysis. Prepared constriction drawings and specifications, construction cost estimates, project bidding, and construction support.
* *Work performed prior to joining CEC*

PROFESSIONAL AFFILIATIONS

American Water Works Association

American Society of Civil Engineers

PRESENTATIONS

Water Resources - Technical Processes Required for Compliance, Marcellus and Manufacturing Development Conference, Morgantown, West Virginia, December 2013

Linda J. Hicks
Geotechnical

23 YEARS EXPERIENCE

EDUCATION

B.S., Mining Engineering, West Virginia University, 1981

M.A., Education, West Virginia University, 1989

Ms. Hicks has more than 23 years of geotechnical engineering experience as well as a decade of project management experience. Ms. Hicks has conducted geotechnical investigations for a myriad of clients including coal companies, power generation facilities, manufacturing plants, municipalities, engineering companies and developers. She routinely develops scope and fees for small to moderate single discipline projects or for the geotechnical aspect of multi-discipline projects. She manages and coordinates the subsurface exploration and laboratory testing, provides geotechnical engineering analysis and design which includes preparation of design calculations and completion of design submission reports and specifications.

Jane's technical skills include development of deep and shallow foundation recommendations, slope stability analysis, fill slope design, reinforced soil slope design, and development of geotechnical recommendations for difficult sites.

PROJECT EXPERIENCE

Wind Power

Mortenson Wind Power, Mortenson, Mount Storm Grant, WV*
Performed the geotechnical evaluations necessary to aid in the design of the proposed 2.0MW turbines on 256 foot towers to be supported by mat foundations. Supervised the field work for eighty-two turbine sites in Grant County near Mount Storm, WV. Supervision included thermal resistivity testing, soil resistivity testing, and excavation of test pits in areas of old surface mine spoil. Supervised laboratory testing services and compiled the design report which included earthwork and foundation recommendations.

Transportation/Aviation

Raleigh Street Extension, Parsons Brinckerhoff, Martinsburg Berkeley, WV*
This WVDOT project included the proposed construction of six new bridges. Ms. Hicks prepared subsurface investigation plans, assisted and supervised the collection of subsurface data in the Karst terrain, and assigned laboratory testing. She prepared design reports which included foundation recommendations, cut and fill slope recommendations, slope stability analyses, LPILE analyses, and pile drivability studies.

Morgantown Airport, Alpha Engineering, Morgantown Monongalia, WV*
Ms. Hicks prepared several proposals and detailed reports of geotechnical evaluation for the growing local airport. Supervised the subsurface investigations and geotechnical evaluations for the proposed administration building, maintenance building, taxi-way extension, and runway extension. Developed a deep mine remediation plan for the administration building with the site stabilized prior to construction activities. Provided a mixed fill slope design for the Runway South Safety Extension which included a steepened slope and reinforced soil slope design.

Oil & Gas

Well Pad and Access Roadway Development, Statoil, Clarington Monroe, OH*
Supervised the drilling operations, reviewed the subsurface information, and developed the geotechnical design reports for multiple sites in Monroe County Ohio. Evaluated slope stabilities, designed reinforced soil slopes as necessary, and prepared bearing capacity and settlement calculations as stipulated by the ODNR.

Linda J. Hicks

Geotechnical

Well Pad and Access Roadway Development, Statoil, Middlebourne Tyler, Wetzel, WV*
Managed drilling operations, reviewed subsurface information and developed the geotechnical design reports for multiple sites in Tyler and Wetzel counties. Evaluated slope stability, interpreted laboratory test results, and provided specialized earthwork recommendations.

Well Pad Development, CNX, Stone Energy, EQT, Various Doddridge, Harrison, Monongalia, Tyler, Wetzel, WV*
Managed drilling operations, reviewed subsurface information and developed the geotechnical design reports for multiple sites in Tyler and Wetzel counties. Evaluated slope stability, interpreted laboratory test results, and provided specialized earthwork recommendations.

Local Government

Dorsey Knob Slide, Morgantown BOPARC, Morgantown Monongalia, WV*
Ms. Hicks investigated a slide at Morgantown's Dorsey Knob Park. She developed a subsurface investigation, monitored the drilling operations, and prepared a geotechnical evaluation report. She performed a slope stability analysis and design a new fill embankment. Ms. Hicks provided supervision and QC during construction activities to remediate the slope.
* *Work performed prior to joining CEC*

Jason B. Heflin
Senior Designer

26 YEARS EXPERIENCE

EDUCATION

A.S., Applied Science, West Virginia University of Parkersburg, 1993

Mr. Heflin has over 26 years of experience working under engineers as a utility designer. His design experience includes sanitary sewer and wastewater treatment plants and potable water lines and plants.

PROJECT EXPERIENCE

Sanitary sewer extension, wastewater treatment plant and upgrades, Greater Harrison County PSD, West Milford Harrison, WV*
Role: Designer and plan preparation
Multiple sanitary sewer line extensions and pump stations, existing wastewater treatment plant upgrades, proposed new wastewater treatment plant.

Sanitary sewer extension, wastewater treatment plant and upgrades, City of Ripley, Ripley Jackson, WV*
Role: Designer and plan preparation
Existing sanitary sewer line and pump station upgrades, existing wastewater treatment plant upgrades.

Sanitary sewer extension, wastewater treatment plant and upgrades, City of Bridgeport, Bridgeport Harrison, WV*
Role: Designer and plan preparation
Multiple sanitary sewer line extensions and pump stations upgrades and extensions, existing wastewater treatment plant upgrades, proposed new wastewater treatment plant.

Sanitary sewer extension, wastewater treatment plant and upgrades, Preston County PSD, Bruceton Mills Preston, WV*
Role: Designer and plan preparation
Proposed SBR wastewater treatment plant and upgrades to existing pump stations

Sanitary sewer extension, wastewater treatment plant and existing sanitary sewer upgrades, Malden PSD, Malden Kanawha, WV*
Role: Designer and plan preparation
Existing sanitary sewer system upgrades on lines and pump stations, new wastewater treatment plant effluent pipe

Sanitary sewer extension, wastewater treatment plant and upgrades, Town of West Union, West Union Doddridge, WV*
Role: Designer and plan preparation
Existing sanitary sewer line and pump station upgrades, new wastewater treatment plant

Sanitary sewer extension, wastewater treatment plant and upgrades, Town of Junior, Junior Barbour, WV*
Role: Designer and plan preparation
Existing wastewater treatment plant upgrade and sanitary sewer line extensions with pump stations

Wastewater treatment plant, Town of Belmont, Belmont Pleasants, WV*
Role: Designer and plan preparation
Existing wastewater treatment plant upgrades

Sanitary sewer extension, wastewater treatment plant and upgrades, City of Weston, Weston Lewis, WV*
Role: Designer and plan preparation
Existing sanitary sewer upgrades to lines and pump stations, proposed new line extensions and wastewater treatment plant upgrades

Elevated raw water intake structure and raw water lines, Chevron, Moundsville Marshall, WV*
Role: Designer and plan preparation
Proposed elevated raw water intake structure and multiple raw water lines

Elevated raw water intake structure and raw water lines, Stone Energy, Proctor Wetzel, WV*
Role: Designer and plan preparation
Proposed elevated raw water intake structure and multiple raw water lines

Sanitary sewer extension, wastewater treatment plant and upgrades, City of Clarksburg, Clarksburg Harrison, WV
Role: Designer and plan preparation
Multiple sanitary sewer upgrades and upgrades to existing wastewater treatment plant

Wastewater treatment plant, Preston County PSD, Masontown Preston, WV*
Role: Designer and plan preparation
Proposed MBR wastewater treatment plant

Proposed sanitary sewer extensions, pump stations and wastewater treatment plant, Hepzibah PSD, Hepzibah Harrison, WV*
Role: Designer and plan preparation
Proposed sanitary sewer extensions, pump stations and wastewater treatment plant

Curtiss Wright Water Well #4 Improvements, Custiss Wright, Cheswick, PA
Role: Designer and plan preparation

Elevated raw water intake structure, Southwestern Energy Corporation, Proctor Wetzel, WV*
Role: Designer and plan preparation
Proposed elevated raw water intake structure

Raw water intake structure, Southwestern Energy Corporation, McMechen Marshall, WV*
Role: Designer and plan preparation
Proposed raw water intake structure

Sanitary sewer extension and upgrades, Brooke County PSD, Follansbee Brooke, WV*
Proposed sanitary sewer extensions and pump stations

Elevated raw water intake structure, Antero, West Milford Harrison, WV*
Proposed elevated raw water intake structure
* *Work performed prior to joining CEC*

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4.0 Project Experience

Civil & Environmental Consultants, Inc.

LUMBERPORT DAM EMERGENCY SERVICES

OWNER/CLIENT

Town of Lumberport

LOCATION

Lumberport, WV

CEC SERVICES

Dam Inspection

Topographic and Bathymetric Survey

Emergency Site Assessment

Emergency Dam Rehabilitation Planning

Hydrologic, Hydraulic, and Flood Routing Analyses

Opinion of Cost Estimating

OWNER OBJECTIVE

The New Lumberport Dam and Old Lumberport Dam reservoirs lie across Jones Run Creek and are arranged in series, with the Old Lumberport Dam downstream of the New Lumberport Dam. The New Lumberport Dam is an earthen dam with a concrete emergency spillway on one bank. The Old Lumberport Dam is a concrete dam with a full-width overtopping spillway. In April 2016, the West Virginia Department of Environmental Protection (WVDEP) inspected the dams and submitted a report documenting the condition of the dams, including several deficiencies. The WVDEP also indicated that a Certificate of Approval for the dams is not on record and must be obtained in accordance with Title 47 of the Code of State Regulations, Series 34, Dam Safety Rule (47CSR34) to bring the dams into compliance. The dams are in the WVDEP's High Hazard/Class I category. The New Lumberport Dam has no geotechnical information on file and the Old Lumberport Dam was exhibiting signs of deterioration. There was no Emergency Action Plan (EAP) and Maintenance Plan for the dams in the WVDEP files and there was no inspection report by a registered professional engineer on file.

CEC APPROACH

First, CEC performed a bathymetric and topographic survey of the two dam reservoirs. CEC then performed an inspection on the dams and submitted an Inspection Report to the WVDEP.

On April 17, 2017, the 8- to 12-inch-thick concrete emergency spillway slab buckled and collapsed in place. It is estimated that piping of soil beneath the spillway had occurred over several years and created a void, removing the foundation for the slab. After the WVDEP issued an order to draw down the reservoir, CEC mobilized to the site in order to consult on behalf of the city. CEC prepared a remedial procedure consisting of the placement of fill against a vertical soil scarp to approximately recreate the spillway slope and the installation of a geomembrane liner secured in an anchor trench and attached to the spillway chute walls, which were not disturbed. CEC also prepared an estimate of cost. Then, CEC performed a breach analysis of the concrete and earth dam and prepared all of the inundation mapping. Several different storm scenarios were modeled, including the full PMF . CEC's hydrological and hydraulic (H&H) report included inundation mapping and sensitivity analysis using the breach analysis guidance provided in FEMA P946. Breach width; breach side slopes; and breach formation time, depth, and failure type were established. The H&H report was submitted to the WVDEP and the most recent set of revisions was completed in January 2019.

Civil & Environmental Consultants, Inc.

DAM NO. 3 LABYRINTH WEIR REPLACEMENT – SEEPAGE CONTROL

OWNER/CLIENT

CONSOL Energy, Inc.

LOCATION

Washington County, PA

CEC SERVICES

H & H Analyses

Geotechnical Investigation

Structural Design

Seepage & Stability Analysis

Procure Permit from PADEP

Spillway Pipe Abandonment

OWNER OBJECTIVE

In 2011, CONSOL Energy, Inc. (CONSOL) acquired Dam No. 3 in Washington County, Pennsylvania to utilize the water for future mining and gas needs. The earthen dam is 48 feet high and was constructed in the mid-1890s. In the mid-1920s, the dam was raised 13 feet and a 50-foot wide concrete ogee weir and a 25-foot wide concrete spillway chute and stilling basin were constructed to address discharge of stormwater.

The dam is inspected annually, in accordance with PADEP regulations and maintains a B-1 classification. Current Pennsylvania B-1 dam hazard classifications require the spillway system to handle the discharge associated with a Probable Maximum Flood (PMF). With purchase of the dam, CONSOL needed to upgrade the existing spillway to meet the PMF rainfall event.

CEC APPROACH

CEC was retained by CONSOL to prepare a design of a labyrinth weir, chute and stilling basin to meet PADEP guidelines for PMF discharge (11,000 cfs) and to replace an inadequately sized and deteriorated spillway structure.

CEC conducted a subsurface investigation to collect geotechnical data and locate the Washington coal seam, which outcrops within the reservoir and beneath the existing spillway chute. A diving investigation was performed to locate an abandoned principal spillway pipe at the valley bottom through the embankment. Upon completion of the geotechnical report, CEC supervised the design to remove the existing spillway, chute and stilling basin and design the new spillway structure, which included the reinforced concrete labyrinth foundation labyrinth slab/weir walls, abutment and tie-in walls, a subsurface cutoff wall, topping slab, a wider spillway chute and a stilling basin with integral chute and baffle blocks. Excavation, including excavation of the 60-inch thick Washington coal seam located beneath the labyrinth, grading and fill placement were designed in conjunction with concrete construction.

Civil & Environmental Consultants, Inc.

WASHINGTON DAM NO. 4 LABYRINTH WEIR DRAIN INVESTIGATION

OWNER/CLIENT

CONSOL Energy, Inc.

LOCATION

Washington County, PA

CEC SERVICES

Site Infrastructure Maintenance/Rehabilitation

Utility Design

Piping Design and Analysis

Underwater Diving

Confined Space Entry

Concrete Rehabilitation

Upstream Upper Valve Area

OWNER OBJECTIVE

In 2011, CONSOL Energy, Inc. (CONSOL) acquired Dam No. 4 reservoir in Washington County, Pennsylvania to utilize the water for future mining and gas needs. The 65 feet high earthen dam was constructed in the mid-1890s and is provided with a 65 feet tall circular concrete intake chamber containing piping and valves that was used for the emergency draining of the reservoir and for the collection and distribution of reservoir water for local drinking needs. The pipe inlet for emergency draining was located at the upstream toe of the embankment beneath 55 feet of water; the intake for drinking water was located approximately 15 feet below the water surface and was connected to piping that extended through the embankment and routed the water to a treatment system.

The valves and intake structures of the upstream chamber have not been operated in decades, and CONSOL is initiating construction of a new labyrinth weir for stormwater drainage and a floating pump system to meet current Pennsylvania dam hazard classification, which includes provisions for reservoir drawdown. Part of the design will include abandonment of the inoperable valve and piping system functioning as the emergency drain and rehabilitation of the piping, valves and intake structure that served drinking water needs. The rehab of the upper intake will be used to provide water via gravity to an existing pump station located at downstream toe of the dam, which will pump water for future mining & gas needs.

CEC APPROACH

In April of 2013, CEC conducted a dive investigation of the emergency drain intake and a confined space investigation of the concrete intake chamber to review the conditions of the above mentioned appurtenances. The investigation collected audio and visual data from both inside and outside the intake structure. Upon review of the data, CEC prepared drawings, work plans and specifications for abandoning of the emergency drain and rehabilitating specified pipe systems and valves. Drawings and specifications were also prepared for rehabilitation of deteriorating concrete surface areas of the intake chamber and a pedestrian walkway from the embankment crest to the top of the intake chamber. An operation and maintenance plan will also be prepared to ensure periodic use of the movable components of the system and to meet Pennsylvania dam inspection requirements.

Civil & Environmental Consultants, Inc.

SIDE SCAN SONAR SURVEY, GEOTECHNICAL DRILLING LOCATIONS LOCK & DAM 2

OWNER/CLIENT

Spectrum Engineers and Associates

LOCATION

Monongahela River, PA

CEC SERVICES

Side & Sector Scanning Sonar

Post-Processing Onsite

Data Interpretation

OWNER OBJECTIVE

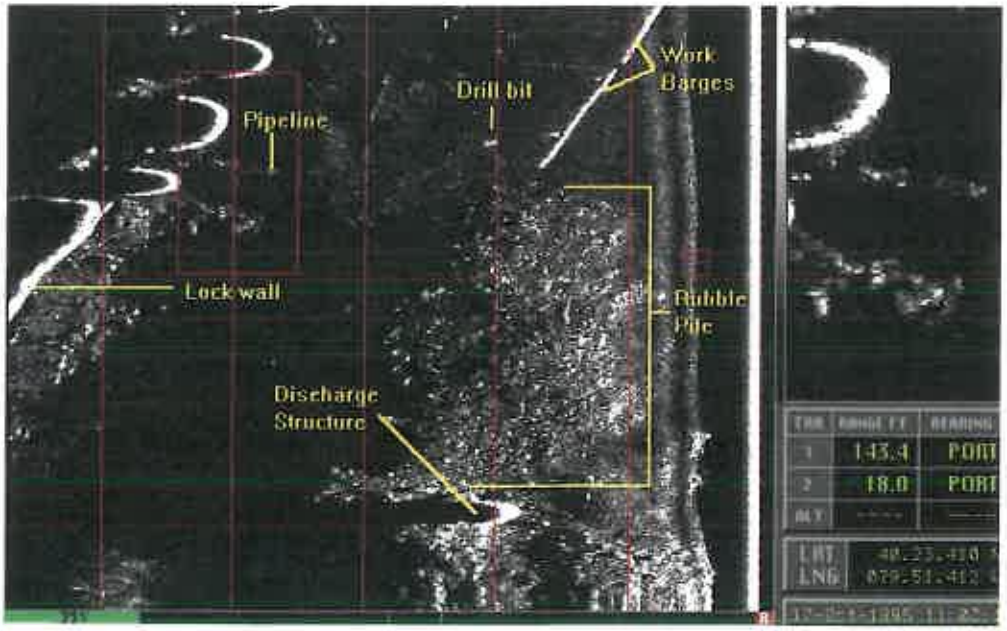
Spectrum Engineers and Associates needed to select accurate locations for subsurface geotechnical drilling in an area immediately upriver of Lock and Dam #2 on the Monongahela River. As a challenge of the project, an underground pipeline and massive concrete pile were very close to the proposed sampling location.

CEC APPROACH

CEC was contracted by Spectrum Engineers to perform a Side Scan Sonar Survey. CEC personnel scanned the proposed area with the sonar equipment from different angles. Images were then printed out and evaluated, and sampling location determinations were made within minutes upon completion of the survey.

The imaging sonar proved to be a valuable tool in the selection of drilling locations. The use of imaging sonar saved the client both time and money by accurately locating drilling locations surrounded by subsurface hazards. The survey also prevented the damage or loss of equipment and avoided the potential liabilities involved with drilling into a subsurface pipeline.

Side Scan and Sector Scan Sonar can be used in a number of underwater construction and engineering operations. These operations include preliminary and final inspections and surveys, excavating, placement of equipment/structures, and monitoring operations. The imaging sonar can play a vital role at every stage. It reduces costs, and simplifies operations, allowing the user to virtually "see" exactly what is happening underwater. Work on bridge footers, pipelines, cables, tunnels, foundations, breakwaters, flood control gates, sub sea production platforms and wellheads can be greatly facilitated through the use of imaging sonar.



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5.0 Forms

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Jason M. Pauley, P.E. Project Manager
(Name, Title)

(Printed Name and Title)
600 Marketplace Avenue, Suite 200
(Address)
(304) 848-7119 / (304) 933-3327
(Phone Number) / (Fax Number)
jpauley@cecinc.com
(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Civil and Environmental Consultants, Inc.
(Company)

(Authorized Signature) (Representative Name, Title)

Jason M. Pauley, P.E. Project Manager
(Printed Name and Title of Authorized Representative)

5-12-2020
(Date)

(304) 848-7119 / (304) 933-3327
(Phone Number) (Fax Number)

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

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

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

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

DEFINITIONS:

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

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

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

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

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Civil and Environmental Consultants, Inc.

Authorized Signature: _____ Date: 5-13-2020

State of West Virginia

County of Harrison, to-wit:

Taken, subscribed, and sworn to before me this 13 day of May, 2020

My Commission expires March 24, 2021

AFFIX SEAL HERE

NOTARY PUBLIC OFFICIAL SEAL
SYDNEY JACOBS
State of West Virginia
My Comm. Expires Mar 24, 2021
Civil & Environmental Consultants Inc
500 Marketplace Suite 200
Bridgeport WV 26330

NOTARY PUBLIC Sydney Jacobs

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Appendix -
A. CEC Dam Strategy

CEC Dam Strategy

The following is a general dam overview of what CEC can provide Camp Dawson.

The design of the embankment repair/replacement of Pierce Lake Dam will be prepared in accordance with Title 47 of the Code of State Regulations, Series 34-Dam Safety Rule (47CSR34), as administered by the West Virginia Department of Environmental Protection (WVDEP). Using these rules, and based upon the information provided by the State of West Virginia, the proposed embankment will be classified as a dam because it has a height of at least 25 feet and can impound 15 acre-ft. of water. It is anticipated that the dam will be issued a Class I (High Hazard) classification. Per 47CSR34, "This classification must be used if failure may result in the loss of human life. With this baseline information, CEC has prepared the following scope of work to prepare the design of the dam for the State of West Virginia facility. Principal design components for the dam will include:

Each of these items is discussed in greater detail below.

Pre-Application Meeting with WVDEP

Upon notice to proceed, representatives of State of West Virginia, WV ARNG and CEC will meet with WVDEP representatives in Charleston to introduce the key players and explain our proposal for the facility. CEC has been successful in using this meeting to create a teaming relationship with WVDEP. CEC will present the technical concepts for the project, including permitting components, with the State of West Virginia providing project goals and objectives. We will request that WVDEP will provide guidance on the submission process and their expectations for the project. Meeting minutes will be prepared and issued to the meeting attendees.

Review of Existing Information

CEC will review the existing data provided by the State of West Virginia for the site, including the watershed, dam, and reservoir area. Materials reviewed are anticipated to include topographic mapping and LIDAR data. CEC will also review available subsurface information, possibly including coal and overburden and structure contour maps. The information will be used to assist in the development of a geotechnical investigation program for the site.

Site Reconnaissance

CEC will visit the site to perform a surficial reconnaissance of the dam area, which will include the footprint of the proposed embankment, the anticipated pool shoreline at the proposed water's edge, the proposed dam abutments connecting the embankment to existing valley slopes, the area to be inundated by water upstream of the embankment and the anticipated route of stormwater discharge from principal or emergency facilities downstream of the proposed embankment. CEC personnel will also perform a reconnaissance for landslides. During the reconnaissance, CEC will also evaluate equipment accessibility for the geotechnical investigation, identify potential borrow areas, document existing natural water flow routes and to a lesser extent, accessibility for construction. Photos will be taken of pertinent features and notes and sketches will be prepared. Field notes will be provided in electronic format to The State of West Virginia, if requested.

Upon completion of the site reconnaissance, CEC representatives will select and stake the locations of test borings that will be drilled as part of the geotechnical investigation described in the next section of this proposal.

CEC representatives will also stake the locations of access roads to be cleared by dozer to access the locations of the test borings. CEC is proposing drilling access to be from the south. This will allow for a reconnaissance of the area proposed for the main camper bus road leading into the site and also avoid using the valley hollow below the proposed embankment, which contains a stream channel. Access roads will be located to avoid crossing any streams in the area unless impractical to do so.

Geotechnical Investigation

CEC will conduct a geotechnical investigation consisting of the drilling of 15 test borings at the proposed dam embankment and reservoir location as required by Section 7 of 47CSR34. If requested, CEC will prepare a geotechnical investigation work plan for The State of West Virginia. The work plan will expand on the information presented in this proposal and describe the details of the proposed investigation, including access, rig trimming, equipment securement on slopes, if necessary, and test boring decommissioning. The work plan will be provided to The State of West Virginia two to four weeks before the proposed drilling will be initiated.

a. Boring Locations – CEC is proposing to drill 8 test borings along the embankment centerline based on our experience with projects of this nature and the existing 700-foot long embankment crest. The borings will be advanced at least 20 feet into rock and the test borings near either end of the proposed embankment (with a higher ground surface elevation) will be advanced 40 feet into bedrock. The final depth of the borings will be selected to obtain an overlap of rock type and strata across the embankment centerline. Two additional test borings will be advanced near the anticipated location of the upstream toe and at a location intermediate between the upstream toe and the embankment crest centerline. Two test borings will also be advanced in this same manner in the downstream direction. Four test borings will be advanced throughout the area proposed for the reservoir. These borings will be used to obtain depths and characteristics of soil to be possibly excavated and used for embankment fill or organic soil cover. Bedrock will also be sampled in these four borings to assess the extent of fractures that may be present. If fractures with inclination toward the embankment are present, issues with additional seepage may need to be addressed during design.

b. Test Drilling Techniques - CEC will subcontract a qualified drilling company licensed in the State of West Virginia to perform the geotechnical test drilling. The test borings will be advanced using a track mounted drill rig using the access roads staked as previously described in this proposal. The drilling crew and the CEC representative monitoring the drilling will follow all CEC safety policies through project completion.

   Hollow stem augers will be used to advance the borings. Standard penetration testing (SPT) and split-spoon sampling of the subsurface soils shall be performed for all test borings, beginning at the ground surface, in accordance with ASTM D1586 to split spoon refusal/top of bedrock. Split

spoon samples will be collected on 2.5 feet intervals, as specified in the RFP. The drilling firm will provide the glass containers with lids for the soil samples and cardboard boxes to store and transport the samples. The following information will be attached to each glass container: (1) test boring number; (2) depth of sample; (3) blow counts; (4) date; and, (5) dam site number. The two 6-inch increments of soil (12-inches total) corresponding to the 'N-value' will be collected by the drilling firm. The 6-inch increments will be placed in separate jars and labeled as 'top' or 'bottom'. Split-spoon samplers used by the drilling firm shall be capable of collecting a minimum of 18-inches of soil; separate blow counts shall be recorded by the driller for each 6-inch sample interval.

Up to four (4) Shelby tube samples will be collected in conjunction with split-spoon sampling, in accordance with ASTM D1587 if soils conducive to undisturbed samples are encountered. It is anticipated that Shelby tubes will be advanced at locations to collect soils needed for estimating the shear strength characteristics of the soil for use in the stability analysis model and to evaluate the soils at the elevation of the seeps. The location and depth of the Shelby tubes will be selected by CEC during drilling activities.

Rock coring will be performed in accordance with ASTM D 2113. NQ size core is proposed to be collected.

After visually observing the bedrock core obtained from the borings, CEC may recommend packer testing of the bedrock to assess its permeability, which will be controlled by fracturing or the overall integrity of the shallow bedrock.

After each test boring has been drilled to the stated depth, water level readings will be obtained and documented. A second set of groundwater elevations will be obtained 48 hour after drilling is completed. Prior to demobilizing from the site, each test boring where rock coring was performed will be backfilled with a neat cement bentonite grout containing at least 6% bentonite. Soil zones will be backfilled with drilled auger cuttings. Temporary piezometers are not anticipated to be installed, unless requested by the State of West Virginia.

c. Monitoring of Investigation - CEC will provide a project representative to monitor the drilling program, make modifications as necessary, prepare test boring logs and rock coring logs, and take custody of the soil and rock samples collected by the drilling firm. CEC will be responsible for transporting the samples to the geotechnical laboratory for analyses.

Geotechnical Laboratory Testing

CEC will subcontract the services of a geotechnical laboratory to perform the testing on selected samples obtained during the geotechnical investigation and the borrow area investigation. Selected soil samples will be subjected to index testing (Atterberg limits, USCS classification, and gradation) and moisture content in accordance with applicable ASTM criteria. After index testing is completed and the results reviewed, selected samples will be subjected to additional testing which is anticipated to include triaxial shear, consolidation, dispersion analysis testing, hydraulic conductivity and proctor compaction tests. The results of this testing will provide parameters for use in analysis and design.

Geotechnical Report

CEC will prepare a geotechnical data report presenting the results of the geotechnical and borrow area investigations. The report will describe the site subsurface conditions encountered, the results of the geotechnical testing performed, ASTM standards utilized during the investigation and provide conclusions regarding the existing subsurface conditions beneath the proposed embankment and reservoir and conclusions regarding the quality of the borrow area soils. The report will be supplemented with a test boring location plan, geological cross-section, our field representative's boring logs, soil and rock core photos and laboratory test results. The geotechnical report will be prepared in accordance with the requirements of NEM Part 531 Subpart A and ASTM D420. CEC will provide hard copies and electronic copies of the report.

Hydrologic and Hydraulic Calculations for Dam Design

CEC will perform hydrologic calculations to evaluate the characteristics of the watershed surface contributing to the reservoir, the rainfall values and duration and the runoff into the reservoir and the resulting routed outflow from the dam and spillway structure in accordance with Section 7 of 47CSR34. Parameters selected for analysis will be selected assuming a Class 1 classification of the dam,

CEC will use the HEC-HMS model developed by the United States Army Corps of Engineers (USACE) to develop a the hydrologic design and the HEC-RAS model to develop the dam hydraulic facilities while meeting requirements for discharging the specified flood events and for establishing the pool level proposed by the State of West Virginia. This trial and error process will verify the dam crest elevation and pool elevation, the principal spillway pipe diameter, the emergency spillway width, depth and slope, the emergency spillway channel geometry, the water depth in spillways, the tailwater elevations beyond the spillways, freeboard distances and erosion protection downstream of these dam appurtenances. Elevation vs. storage relationships using the topographic mapping of the proposed reservoir area will be developed and preliminary drawings will be prepared to illustrate the hydraulic design. It is anticipated that the State of West Virginia will provide the topographic mapping that will be needed to prepare hydrologic and hydraulic (H&H) calculations.

Following calculation development, CEC will prepare an H&H Report that describes the analysis and design process, the parameters selected for design and the software results. Upon completion, the H&H report will be provided to The State of West Virginia.

Preliminary Design of Dam

Preliminary Design will be prepared that provides the geometric and site layout of the embankment and limits of the reservoir, the principal spillway and emergency spillway, and the location of flow downstream of the embankment using the hydraulic and hydrologic analysis described in the preceding section of this proposal. The location of the embankment tie-in to the valley slope and side wall be provided as will the foundation development and tie-in to existing ground. The borrow area location(s) will also be identified.

Preliminary design data needed to develop the design to this stage include H&H analysis and applicable geotechnical analyses. Site development adjacent to the embankment and reservoir as discussed in other sections of this proposal will also be evaluated. The Preliminary Design will also present a

preliminary phasing of the construction that will include plans for diversion of storm water during construction. Foundation soils that may need to be removed to facilitate the design of the embankment foundation or a cutoff wall will also be identified, as well as any overexcavation of unsuitable soils to confirm proper foundation bearing.

In addition to the preliminary design drawings, a table of contents of the specifications will be prepared, along with a brief description of what the specifications will include. The conceptual design layout will be prepared in AutoCAD format and will provide detail equivalent to a 25% to 30% submission document. The conceptual design will be submitted to The State of West Virginia and informally presented to WVDEP during a meeting for conceptual approval before detailed geotechnical, civil and structural design will proceed, as discussed below.

Final Design of Dam

Comments from The State of West Virginia on the Preliminary Design will be incorporated into the Final Design. The Final Design will generate specific design and details of items presented in the preliminary drawings. It will also utilize geotechnical parameters developed from the subsurface investigation.

The design of the dam will be prepared in accordance with applicable parts of Section 7 of 47CSR34 and using the following Engineering Manuals (EM) and Engineering Regulations (ER) developed by the USACE.

Drawings and specifications will be submitted at 35%, 65%, 95% and 100% completion to the State of West Virginia. Cost estimates will be revised and included with each submittal. 100% Final Construction Plans will be submitted both digitally and 3 full size hard copies to the State of West Virginia.

The Final Design will consist of the following items:

a. Zoning of Embankment Fill – The results of the borrow area study will be used to identify the type and volume of soil available to construct the embankment. CEC proposes to develop a homogeneous design that utilizes a very low permeability soil material throughout the embankment; however, if a sufficient volume of that type of material is not available, CEC will design a zoned embankment using a clay core surrounded by soils best suited for embankment construction.

b. Seepage Analysis – An analysis will be prepared to estimate the volume of seepage through the embankment. The analysis will consider the depth of water in the reservoir and the materials used to construct the embankment, the existing soil and rock materials left in place beneath the embankment and any additional design features or modifications to existing materials. The seepage analysis will be used to develop designs for drainage.

c. Internal Drainage – Internal drainage systems will be designed to control the phreatic surface through the embankment and seepage beneath and around the embankment. The extent of the drainage system will be based on the soils used to construct the embankment. Areas where a change in hydraulic conductivity occurs between dissimilar soils will need to be evaluated for control of gradients and seepage. Drainage systems will be designed to safely outlet beyond the downstream toe of the embankment and discharge to the existing or designed stream channel.

d. Stability Analysis - The embankment geometry will be evaluated for stability using the SLIDE program. The stability analysis will be performed on the critical embankment cross-section using soil parameters for embankment and subsurface soils obtained from the results of the borrow area investigation and the geotechnical investigation. The embankment will be evaluated against sliding for three conditions, including a maximum pool condition, a sudden drawdown condition and a daily static condition. If necessary, a slope stability analysis will be performed on the excavated stream channel embankment located downstream of the main dam embankment, to determine its factor of safety against sliding. Factors of safety from the SLIDE program will be compared against minimum factors of safety presented in applicable regulatory criteria, including WVDEP regulations. If a zoned embankment design is utilized, CEC will evaluate applicable slopes created during construction using the appropriate soil parameters and cross sections.

e. Borrow Area Development – Locations selected for borrow will be designed for stockpiling of overburden soils and removal of soils needed for construction. Excavation slopes, borrow depths and provisions for stormwater collection, treatment and drainage will be developed. Access roads from the area to the embankment will also be designed.

f. Foundation Treatment. - The results of the geotechnical analysis will generate recommendations for the preparation of the soil and/or rock foundation beneath the embankment. The design of a cutoff wall through soil and rock using cohesive soil, bentonite, concrete or a combination of these materials may be proposed. Excavation of materials resulting in seepage issues may also be designed.

g. Principal Spillway Design –A principal spillway consisting of a pipe culvert through the embankment at a location near the natural bottom of the lake will be designed to provide a mechanism for operational drainage of the reservoir, to maintain reservoir pool and contribute to the safe discharge of storm events. It is anticipated that the principal spillway will be designed to address discharge of stormwater associated with 24 hour duration events. The pipe will be designed with a gate valve installed within a concrete riser structure or gatewell that will be located on the upstream side of the embankment. A pedestrian walkway will be designed from the embankment crest to the riser structure to access the gatewell. A decision from The State of West Virginia will be needed to select whether the walkway will be secured to allow for authorized personnel only, or if camp attendees will be permitted to view the reservoir from this area.

h. Emergency Spillway Design - A spillway control section and trapezoid channel will be designed to handle the flow associated with the reservoir outflow from the PMP event. Hydraulic analyses developed during the preliminary design using the HEC-RAS software program will be refined based on any needed modifications to estimate the depth of water, slope and height of spillway sidewalls to maintain stormwater in the channel. It is anticipated that the emergency spillway channel will be constructed in earth and rock and that design of a concrete lined spillway with vertical sidewalls is not anticipated. However, a reinforced concrete spillway can be designed if space or valley slopes do not provide the necessary width and erosion-resistant materials necessary for a natural designed channel.

i. Bearing Capacity and Settlement Analyses - A bearing capacity analysis and a settlement analysis will be performed on the embankment, using the geotechnical testing results . The analyses will

evaluate whether any additional embankment height is needed to maintain the hydrologic and hydraulic design needs.

j. Riprap. Riprap will be designed to prevent scour at the reservoir entrance to the emergency spillway, at the exit of the emergency spillway and to prevent erosion or instability of the natural channel banks downstream of the end of the existing spillway. In addition to the USACE EM identified in this proposal, riprap will be designed in accordance with methods provided in USACE Hydraulic Design Criteria Sheet 712-1 (Isbash), Peirson & Cameron, and Abt & Johnson.

During the design phase of similar historical projects, CEC has arranged a meeting with a construction contractor to identify opportunities for construction efficiencies. Design elements where various construction approaches are possible and where input will be incorporated include: foundation design, placement of fill, embankment abutment tie in, phasing of construction, management of stormwater and/or spillway construction.

Permit and Construction Drawings

Permit and construction drawings will be prepared for submittal to WVDEP for review, and to support the construction of the dam. Introductory or index drawings will be part of the entire package. Approximately 30 drawings will be prepared to facilitate construction of the dam, consisting of the following:

- Existing Conditions Plan and Details (2)
- Erosion and Sediment Control Plan, Sections and Details (4)
- Site Preparation Plans, Sections and Details (2)
- Embankment Plan, Sections and Details (6)
- Excavation Plan, Sections and Details (2)
- Emergency Spillway Plan, Sections and Details (3)
- Principal Spillway Plan, Sections and Details (3)
- Phasing/Dewatering Plan, Sections and Details (2)
- Supplemental Elevations and Sections (3)
- Supplemental Construction Details (3)

These drawings will be prepared in AutoCAD format and will be provided to The State of West Virginia on standard State of West Virginia approved border sheets, unless otherwise indicated. Drawing size will be 22" by 34". This drawing size allows for true, half-scale 11"x17" drawings to be produced. It should be noted that all of these drawings may not be required for obtaining permits from appropriate federal, state and local agencies. The specific drawings that may be required is discussed in the permitting process, are described in subsequent sections of this proposal.

Quantities and Engineers' Construction Cost Estimate

Quantities of all items associated with the components of the dam construction will be developed. A excel spreadsheet will be prepared to summarize the quantities. An engineers' construction cost estimate will be prepared utilizing those quantities. The cost estimate will be prepared in excel format, and will utilize cost data obtained from historical projects, cost data based upon our professional experience or cost

databases utilized in the preparation of MCACES cost estimates recently submitted to the United States Army Corps of Engineers. The cost estimate will be arranged in a bid form format, for use in contractor procurement at a later date. Quantities and costing will also be prepared for the construction features associated with the erosion and sediment control and stormwater management, which are needed as part of the permitting process. The accuracy of the construction cost estimate is estimated to be ±20%.

Specifications

Technical Specifications will be prepared to guide the contractor through construction of the project. The specifications will be prepared in the MasterSpec format. The table of contents prepared during the Preliminary Design will be expanded to include information o materials, execution and measurement and payment. A bid form will also be prepared to identify and separate work into biddable components of work, for use in the bidding process. The State of West Virginia will be responsible for providing the administrative/commercial portion of the bid documents. CEC can provide these documents if requested by the State of West Virginia.

Design Report

In accordance with Section 6 of 47CSR34, a Design Report will be prepared that discusses the design of the dam, including the design criteria, the basis for design, the hydraulic and hydrologic data used, and any evolution of the design from preliminary to final. A brief discussion on the cost estimate, construction sequencing and specifications will also be provided. A calculation file of the design will also be provided, along with the geotechnical report. It is anticipated that the calculations and any ancillary reports will be addenda to the Design Report. Three (3) hard copies will be provided in a three ring binder with tabs separating sections and Appendices. The report will be prepared in color. In addition to the hard copies, one CD of all information presented in this proposal will be provided.

Construction Quality Assurance Plan

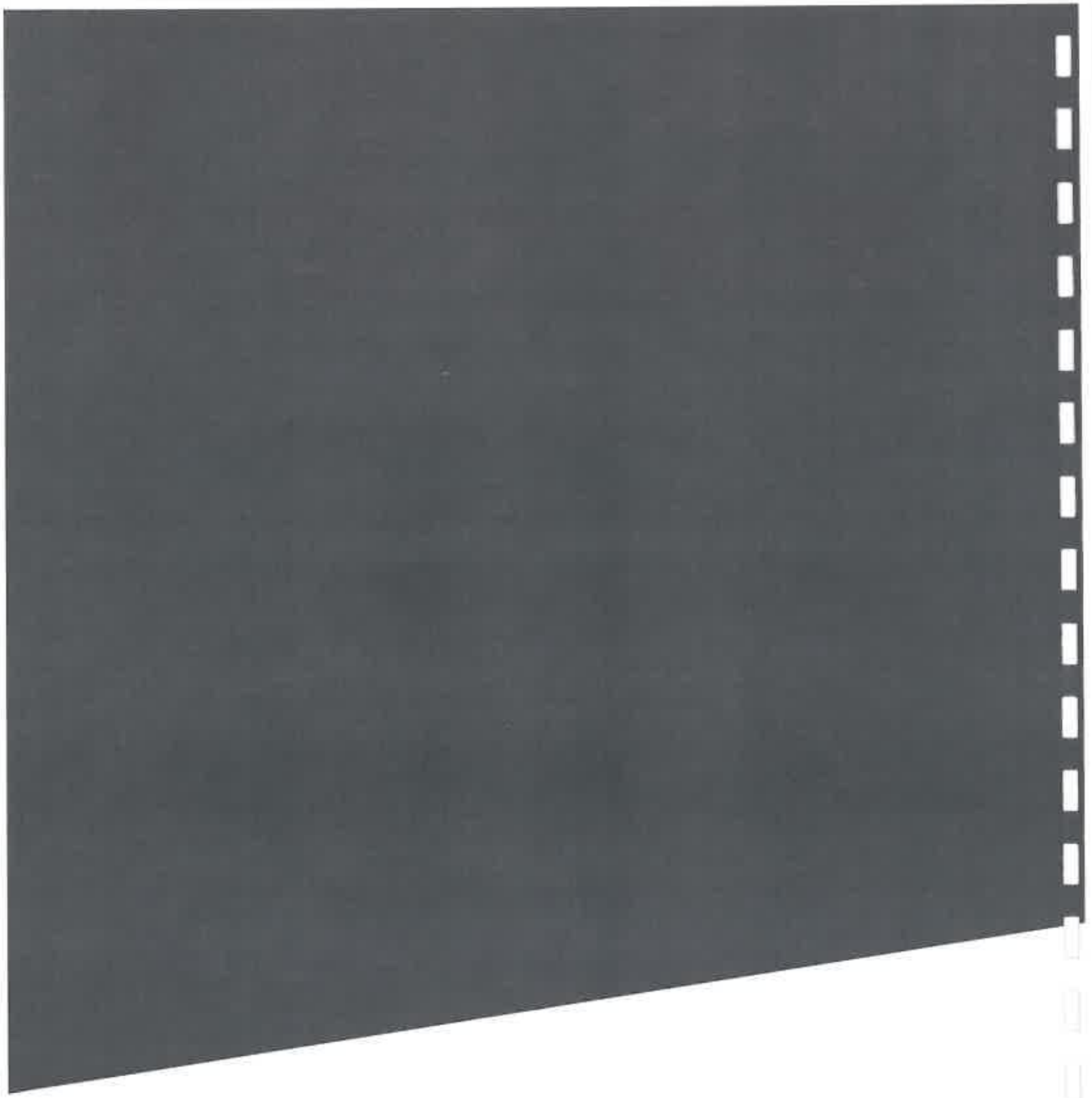
CEC will prepare a construction quality assurance plan for use by inspectors during construction. The CQAP will provide data and data reporting procedures that will be representative of the work performed and will provide legal documentation, if required. It will also provide written quality-oriented protocols for the project, and establish procedures to ensure that the construction quality meets technical design specifications. Specific items presented in the CQAP include:

- Project QA objectives.
- Staff organization and responsibility.
- Project communication, documentation, and record keeping procedures.
- Specific project activities and descriptions of the procedures to be used in sampling, implementation, review, approval, and documentation.
- QC procedures, including observations and tests that will be used to ensure that work meets or exceed all design criteria.
- Certification of Construction requirements;
- Equipment Calibration; and
- Corrective Action (CA) Procedures.

Permitting

CEC has identified the permits and applications that we currently conclude will be required to design and construct this project. The applications and permits required will need to be submitted to the WVDEP. They are available from the agency websites. The permits that may be required include

- General Stormwater NPDES Permit for stormwater discharges associated with construction activities
- Erosion and Sediment Control Application
- Post Construction Stormwater Management Plan
- Dam Permit Application



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