



Civil & Environmental Consultants, Inc.

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DIVISION

**PROFESSIONAL ENGINEERING SERVICES FOR
KEMPTON REFUSE REHABILITATION PROJECT**

CEC | BRIDGEPORT
Project 304-983
September 10, 2020



September 10, 2020

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

Dear Mr. Nisbet:

Subject: Proposal for Professional Engineering Services
Solicitation No. CEOI 0313 DEP2100000002
EOI – Kempton Refuse Rehabilitation Project
CEC Project: 304-983

Civil & Environmental Consultants, Inc. (CEC) is pleased to submit this Expression of Interest (EOI) to West Virginia Department of Environmental Protection (WVDEP) for the Kempton Refuse Rehabilitation Services, Tucker/Preston County, West Virginia. Our preparation of this proposal is based the Expression of Interest (EOI) dated August 12, 2020 and Addendum 1 received August 31, 2020.

CEC is uniquely qualified for the Kempton Refuse Rehabilitation Services with a substantial history of completing abandoned mine lands (AML) projects in West Virginia and Pennsylvania, familiarity of the regional geology, regional mining geochemistry, and extensive experience developing each project component. CEC employs geochemists with esoteric knowledge of the chemical properties of refuse and mine water aquifers and extensive experience in passive and active mine water remediation. CEC has the internal capability to collect aerial photography and LiDAR data for use in topographic, volumetric, and hydrologic analysis. CEC is a market leader in application of natural stream design methodology and installation of geo-synthetic liners for water conveyance on abandoned mine lands (AML). CEC routinely completes WVDEP National Pollutant Discharge Elimination System (NPDES) Construction Stormwater and West Virginia Department of Transportation (WVDOT) MM-109 permitting.

Section 3.0, Part 1, describes in detail CEC's capability to complete the following tasks: aerial photography, LiDAR scanning, planimetric surveying, geotechnical investigation, hydrogeological investigation, soil and water chemical assessment, grubbing and sensitive area protection, hydraulic and hydrologic assessment, material handling plan, grading plan and access road design, construction drawings and specifications, landslide stabilization design, AMD drainage mitigation, passive treatment system rehabilitation/retrofit, liner installation, revegetation plan, erosion and sediment control plan, and permitting. Section 3.0, Part 2, describes CEC's ecological restoration capabilities. CEC routinely constructs natural stream design on reclaimed AML in place of rock-lined swales. Natural stream design in combination with a native non-invasive revegetation plan improves aquatic and ecological health through proper sediment transport, habitat development, and vegetative protected riparian corridor. Part 2 is included as an option for review by WVDEP Office of Abandoned Mine Lands and Reclamation (WVDEP/AML), but is not required for CEC to complete traditional AML reclamation techniques.

For this project, Kow Eshun will be the project manager and primary point of contact. Greg Linder will serve as the Principal and Quality Manager. Kow and Greg work together in CEC's Bridgeport, West Virginia office and can be reached at the information provided below.

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Project Manager
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We appreciate the opportunity to submit this EOI to you and look forward to working with WVDEP/AML. We believe the scope of services outlined in the attached proposal will address the project's technical needs in a cost effective manner. If you have any questions or comments, please do not hesitate to contact us.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



Kow O. Eshun, PE
Project Manager



Greg S. Linder, PE
Principal

PROFESSIONAL ENGINEERING & CONSULTING SERVICES FOR KEMPTON REFUSE

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1.0 Firm Overview

Civil & Environmental Consultants, Inc. (CEC) is recognized for providing innovative design solutions and integrated expertise in air quality, civil engineering, ecological sciences, environmental engineering and sciences, planning, survey, transportation engineering, waste management, and water resources. CEC was founded in 1989 and currently has approximately 1,000 employees. From our 26 offices, we provide comprehensive multi-disciplinary services to numerous clients across the country. Specifically, CEC has extensive experience providing landslide mitigation services to various clients from our Bridgeport, West Virginia office.

Our Bridgeport Office has successfully completed in excess of 200 landslide mitigation projects in the last year. This experience is highlighted in the resumes of key personnel (Attachment D) and representative project summaries (Attachment E) presented in this SOQ. CEC does not anticipate the need for subconsultant services for this project except for drilling and laboratory testing on an as needed basis.

1.1 Commitment to Safety

CEC is committed to conducting its business in a manner that sustains and protects the safety and health of its employees. CEC strives for continuous improvement in the effectiveness of its safety and health programs. We affirm that:

- Working safely is a key corporate value and a condition of employment.
- All workplace hazards can be safeguarded against by using proactive measures and actions.
- Occupational safety and health is part of every employee's total job performance.
- Each CEC employee is responsible, and is held accountable for establishing safe workplace conditions to prevent injuries and occupational illnesses.
- Training employees to work safely is essential and is the responsibility of CEC Managers and Supervisors.
- Creating and maintaining a safe workplace, combined with the prevention of personal injuries and accidents, is good business.
- An effective Safety Program is part of CEC's vision and mission.

CEC's Workplace Safety Program and Manual provides general physical hazard assessments for tasks commonly performed by CEC employees. The program requires a hazard assessment and preparation of a project safety plan for all field operations. The plans are continuously updated through the use of Job Safety Assessments and on-site safety meetings for CEC personnel.

1.2 Attention to Quality

CEC performs our professional services under our corporate Quality Assurance Plan (QAP). This QAP was developed to verify the engineering, design, plans and other deliverables prepared by the project team and the various disciplines are supported by comprehensive studies and sound engineering judgment, in compliance with established policies, guidelines and standards, and contain appropriate design flexibility and cost saving measures. This QAP entails a comprehensive listing of CEC quality policies and standard operating procedures that are available on CEC's internal network. It is consistently reviewed and updated by a multi-office team of experienced professionals to ensure "Best Quality Control Practices" are uniformly applied. In support of this QAP, CEC is committed to the application of established design policies, guidelines, and processes developed and published by review and resource agencies. From a quality



standpoint, technical personnel review the technical quality, accuracy and completeness of all designs, analyses, drawings, estimates, and report text. Peer-level personnel are responsible for the performance of an independent check of all calculations and project deliverables prior to each project milestone submission.

As part of the QAP, reviews will be performed for the appropriate element throughout the design/construction process. These reviews will be completed prior to submitting reports, plans, construction documentation, or other deliverables. These reviews will verify the adequacy of the information presented and compliance with established guidance documents. The QAP also documents procedures for work procedure and equipment use, employee and project safety, project management and records and communications. The goal and objective of the QC/QA Policy is to provide a safe and consistent delivery of quality services to the City of Morgantown.



1.3 Controlling Costs and Maintaining Schedules

CEC has written quality policies that are provided to all employees; these policies define critical work quality and internal control procedures. Employees are instructed and required to record hours worked daily in the Deltek system and each employee-prepared time sheet is reviewed and approved by a system defined supervisor. Project management personnel have online access to project budgets, project cost and hours, billing and accounts receivable information. In addition to online access, each month the Accounting Department distributes to the project manager and principal-in-charge copies of a summary project status report showing budget and actual project information.

Project cost controls are provided by our fully integrated accounting system. The management information system is used to compile and control costs by project and by task, independent of personnel used, or their office location. Costs specific to the project are consolidated by accounting and verified by the CEC project manager for accuracy. Further accounting control is provided for monthly reviews of all projects. The costs incurred are compared to progress on the projects to confirm that the expenditures of budgeted funds correlate to the overall progress on the projects.



1.4 Staff Availability

CEC regularly reviews workload by office and by Practice through a series of regularly scheduled meetings/reviews. Each office holds a weekly meeting to review new and upcoming proposal activity and reports shared opportunities. Additional practice meetings/ reviews are held to review workload, schedule manpower and anticipate schedule changes. CEC regularly monitors our workload and backlog against staff availability and adds personnel, as necessary, to meet client and project requirements and has the ability to augment staff from our 23 office locations and over 1,000 personnel.

1.5 Multi-Disciplined

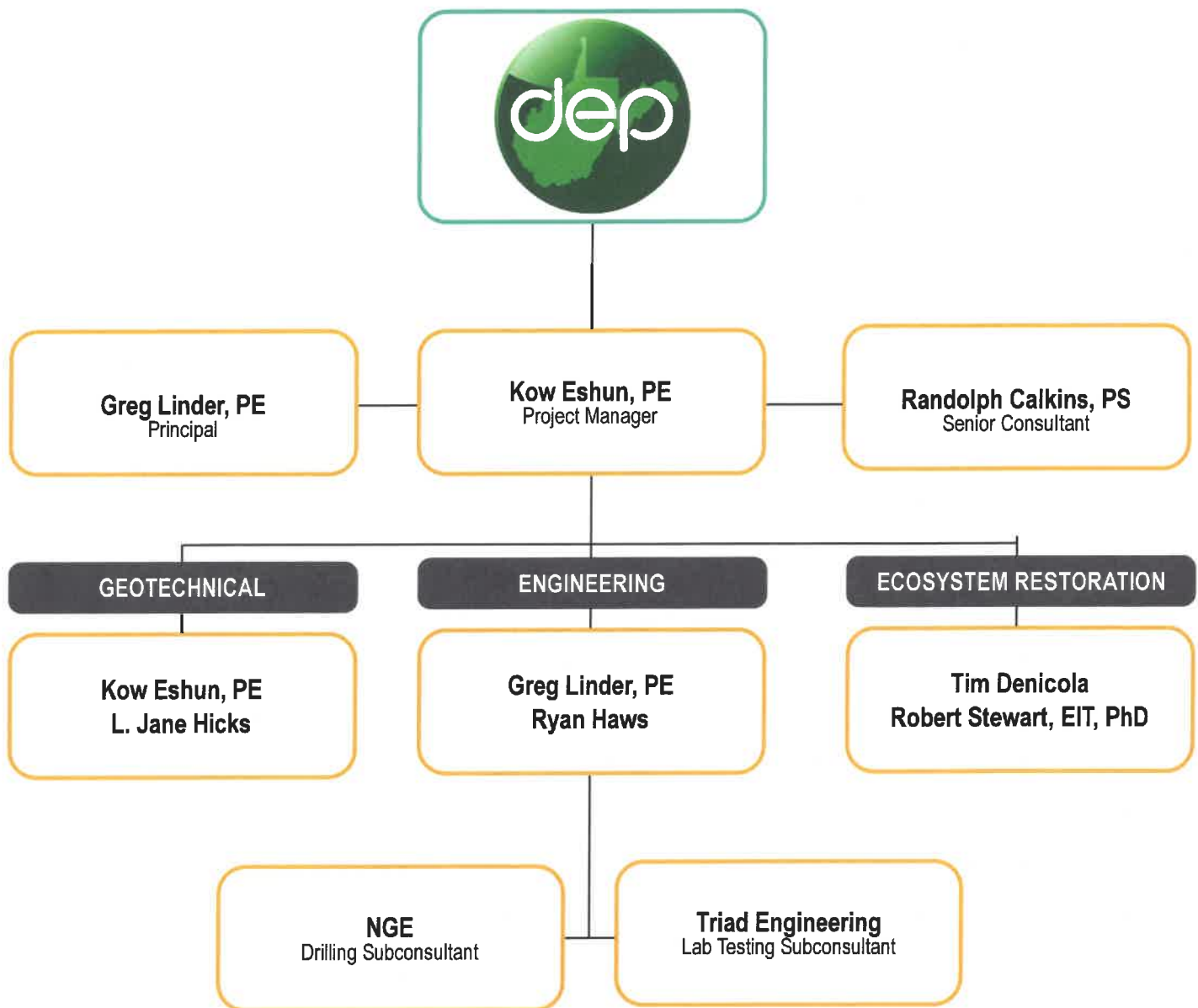
CEC is an expanding company with:

- 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 & Inspectors
- Environmental Technicians
- Treatment Plant Operators
- Land Surveyors
- Landscape Architects
- GIS Analysts & Programmers

2.0 Key Personnel & Sub-consultants

The following key personnel will assist in the Kempton Refuse Rehabilitation project. Each of the individuals included on the project team have the technical knowledge, professional experience and project understanding to support the West Virginia Department of Environmental Protection, Division of Land Restoration, Office of Abandoned Mine Lands and Reclamation (WVDEP-DLR-AML) with the landslide remediation and mitigation of the dangerous impoundments. Each of the anticipated team members presented in the organizational chart that follows is based out of CEC's Bridgeport, West Virginia office.

In addition to the key personnel noted in the organizational chart below, CEC's Bridgeport, WV office has more than 100 personnel who can provide a wide range of services, including but not limited to Field Services, Environmental Engineering and Ecological Services.



The project team identified to work with the WVDEP has extensive experience performing site assessments and landslide remediation and design services throughout West Virginia. In addition, our team has extensive experience in AML Reclamation and Construction, Ecosystem Restoration, and Clean Water Act Permitting.

More specifically, CEC's services will be performed under the guidance/management of **Mr. Greg Linder, P.E.** from CEC's Bridgeport, West Virginia office. Mr. Linder will provide AML experience and oversight throughout the project. He is a West Virginia licensed civil and site engineer with over 20 years of experience in land development. Mr. Linder will oversee all land reclamation aspects of the project.



Mr. Kow Eshun, P.E. will serve as the project manager and provide project oversight and review as well as construction management. Kow has more than ten years of diverse experience in geotechnical engineering, transportation and Construction Quality Assurance. Kow has worked on and managed a wide range of subsurface investigations to provide recommendations for landslide remediation, foundations, slope stability analyses, ground improvement techniques, mine subsidence, and earthwork. Additionally, Kow has managed a wide range of projects in the transportation, health, natural gas, manufacturing, telecom and utilities industries including roadway projects, well pads, compressor stations, building projects, substation construction and expansion. Kow currently serves as our geotechnical practice lead in the Bridgeport office, runs our slip mitigation program, and manages our Construction Quality Assurance field personnel.



Randolph Calkins, PS will act as a Senior Consultant in the development of the refuse reclamation designs. Mr. Calkins has over 40 years in abandoned mine land reclamation in the Appalachian coal fields and has completed over 80 AML projects. Skills include geologic and hydrogeological analysis, extensive grading, and design of hydrologic conveyances on AML.



Ms. L. Jane Hicks will serve as the geotechnical engineer. Jane has more than twenty years of diverse experience in geotechnical engineering. Jane has managed a wide range of projects to provide recommendations for landslide remediation, foundations, slope stability analyses, ground improvement techniques, mine subsidence, and earthwork. Jane is currently a senior project manager in the Bridgeport, WV office. Ms. Hicks will oversee all CEC personnel and sub-consultants utilized on the project.



Mr. Ryan Haws, EIT will provide engineering services for this project. Mr. Haws is experienced in the various aspects of land development, including large-scale residential subdivision design, grading and earthwork analysis, drainage design, water, sewer, and storm water system design, and commercial/multi-family site design. Mr. Haws has also worked with NPDES permitting, Asset Management Plan preparation, Abandoned Mine Land projects, Above Ground Storage Tank permitting and removal, and preliminary site evaluations.



Timothy Denicola, CFM will conduct water quality and soil chemical sampling. Mr. Denicola has a diverse background including expertise in geochemistry, geology, and hydrology. His environmental experience includes mine water remediation, stream restoration, and regulatory compliance. Specific capabilities include watershed based planning, site assessments and recommendations, design of passive and semi-active treatment systems, design of stream restoration corridors, hydrologic and geotechnical analysis, construction quality assurance, environmental compliance audits, and development of various spill control plans.



Robert Stewart, PhD, EIT, will provide ecosystem restoration design support. In his years of experience, Mr. Stewart has a keen understanding of hydraulics, sediment transport and geomorphology. He will help oversee any eco-related services for this project.



Resumes for the above-listed key personnel, including certifications, registrations and project experience have been included in Attachment C.

3.0 Project Overview

3.1 DESIGN PART I: ABANDONED MINE LANDS RECLAMATION

3.1.1 Abandoned Mine Land Services

CEC supports both government agencies and private industry responses to environmental and safety impacts of abandoned mine lands (AML), and often return the AML to productivity. CEC and its personnel have performed projects on AML sites over the last four decades to address concerns such as landslides, mine and refuse fires, abandoned mine drainage (AMD), subsidence, stream sedimentation, hazardous highwalls and portals, and unvegetated and poorly graded disturbed lands and refuse sites. Our success is founded on our experience with active mining projects that have included permitting and design services to support new mines, existing mines, surface portals, processing and storage facilities, beltlines, treatment plants, access roads, and coal refuse disposal facilities.

The disciplines of our personnel include:

- Mining, Civil, Geotechnical, Environmental, Solid Waste, Forensic, & Sanitary Engineers
- Professional Geologists, Hydrogeologists & Environmental Scientists
- Threatened and Endangered Species Experts, Ecologists, Biologists & Wetland Scientists
- Agronomist/Soil Scientists
- Construction Inspectors & Environmental Technicians

- CAD Designers & Technicians
- Registered Land Surveyors
- Registered Landscape Architects
- Geographic Information System Analysts and Programmers
- Archaeologists & Cultural Resources Professionals

CEC assists the mining industry with the development of cost-effective, construction phase-oriented site designs for mines, quarries, refuse/tailings disposal areas, preparation and processing plants, and transportation facilities. Those designs have been prepared for active, inactive, and abandoned sites. CEC integrates all of the design elements and civil engineering aspects required to complete a successful mining reclamation project. We have experience managing the design, approval and onsite construction processes associated with reclamation projects. CEC has provided AML- related services for private industries so they can reclaim and beneficially reuse disturbed lands.

CEC's capability is summarized as having experience in the following fields of the mining industry:

- Coal Refuse Site Reclamation
- Mine Subsidence
- Mass Grading
- Vegetation and Erosion Protection
- Hydrologic and Hydraulic Design
- Mine and Refuse Fires
- Delineation of Water Bodies and Wetlands
- Slope Stability and Geotechnical Exploration
- Construction Support Services
- Private Land Users as End-Point Client

3.1.2 Aerial Photography / LiDAR / Planimetric Survey

CEC will collect up-to-date topographic survey of the project site, if necessary, consisting of mixed-vegetated land. This survey will provide the existing contour mapping of the site at the time of the Small Unmanned Aerial System (sUAS) Flight.

CEC will utilize a sUAS supplemented with ground control points for survey data acquisition of the project area. The sUAS system will consist of the DJI Matrice 600 Pro unmanned aerial unit and the Riegl VUX-1HA LiDAR sensor. Additionally an eBee X equipped with a high-resolution Aeria X camera will be utilized to produce HD aerial imagery creating a geometrically corrected image to depict uniform distances that can be used for measurements. The Riegl LiDAR sensor will obtain the topographic survey data and planimetrics to produce the 1' contour base mapping. The LiDAR data will be acquired within the United States National Map Accuracy Standards (no more than 10% of the elevations tested shall be in error more than one-half of the contour interval). CEC will establish ground control consisting of geodetically controlled points and ground targets to tie the collected data to the specific project location. Ground checks will be performed to ensure accuracy. CEC will provide a Pilot in Command (PIC) and a visual observer for sUAS operations who will perform a preflight inspection, including control station system checks, to ensure safe operations. The sUAS system will remain within the visual line-of-sight of the PIC or visual observer at all times.

Due to the current nature of the technology and FAA oversight, weather can be a factor in our ability to operate the sUAS. The data collection will occur providing the following conditions are not present:

- Prevailing winds in excess of 22 mph
- Precipitation over a light mist
- Thunderstorms in the immediate vicinity
- Less than 3 miles visibility from the PIC's point of view

The final go/no-go decision will be made at the discretion of the CEC project team. Your verbal or written authorization to proceed authorizes CEC to conduct sUAS operation on the subject property. WVDEP/AML understands that any individuals on site during sUAS operations will be a considered a participating person as per Federal Aviation Administration (FAA) regulations.

Traditional survey techniques will be utilized to supplement the sUAS data and collect planimetric details not visible through aerial means and methods. Equipment will include Topcon RTK-GPS and Total Robotic Station. Project deliverables will consist of an AutoCAD Civil 3D 2020 topographic surface along with a georeferenced orthographic image of the existing site.

3.1.3 Geotechnical Investigation / Soil and Water Chemistry

CEC will utilize existing geotechnical information or develop and implement a subsurface drilling program, if necessary, to quantify and qualify onsite materials needed for backfilling and grading disturbed areas. NGE, a Minority and Women Business Enterprise (MBE/WBE), will be subcontracted to complete the geotechnical investigation. Novel Geo-Environmental will conduct boring to assess for physical and chemical properties of site soils, refuse and spoil, and to determine depth to shallow aquifer. Drilling will utilize a 3.25" I.D. hollow-stem auger and 140-lb auto hydraulically operated penetration testing hammer with split spoon sampler. Standard penetration testing (SPT) and sampling will be performed in each boring at 2.5 ft. intervals from the ground surface to the boring termination depth or refusal on bedrock in accordance with ASTM D1586 test procedures. The drilling subcontractor will record depth to groundwater for each boring.

Auger and split spoon samples will undergo laboratory testing for physical and chemical parameters. Physical parameters will include moisture content, Atterberg liquid and plastic limits, grain size sieve analysis and standard Proctor moisture-density tests. Physical parameters will be sampled at 2.5 ft. intervals and utilized to develop a structurally competent grading plan and to identify suitable clay material for toxic material encapsulation. Chemical parameters will include soil pH, specific conductivity, acid-base accounting, total pyritic sulfur, and nutrient content. Chemical parameters will be sampled at 5 ft. intervals and be utilized to identify toxic material and determine lime and fertilizer application rates for revegetation.

Water quality samples will be collected from surface waters, field identified groundwater seeps, and locations within the passive AMD treatment system to quantify and qualify contaminant loads and prepare conceptual treatment calculations. Water quality parameters will include field temperature, pH, specific conductivity, dissolved oxygen, and oxidation-reduction potential. Laboratory parameters will include acidity, alkalinity, total iron aluminum and manganese, dissolved iron aluminum and manganese, calcium, magnesium, and sulfate. Discharge measurements will be collected from water quality sampling locations using a SonTek FlowTracker 2 Acoustic Doppler Velocity Meter. Lower magnitude flows will utilize weirs or installed flow consolidation pipes. Water quality and discharge monitoring will be conducted during base flow conditions to limit stormwater interferences to collected data.

The results of the geotechnical, chemical, and hydrogeological investigation will be incorporated into a Hydrogeological and Geotechnical Investigation Report. CEC will submit a digital *.pdf and three (3) paper copies of the Preliminary Hydrogeological and Geotechnical Investigation Report to WVDEP/AML. WVDEP/AML will review and comment. Following incorporation of all agreed-upon revisions, CEC shall submit a digital *.pdf and three (3) paper copies of the Final Hydrogeological and Geotechnical Investigation Report to WVDEP.

3.1.4 Clearing, Grubbing & Sensitive Area Protection (Environmental Resources)

CEC will design and develop a Clearing and Grubbing plan to remove all woody vegetation, accumulated trash, concrete and block structures, and other mining debris and equipment from the Project areas; Delineated wetlands and waterways will be protected by biodegradable filter sock. Timber removal will be managed per landowner request.

3.1.5 Grading Plan and Specifications, Access Road Construction

CEC will complete the layout of the reclamation of the disturbed areas and establish the proposed final elevations and grades for the site.

- CEC will complete a site visit to review existing features, site limitations, and understand the natural landscape. The findings of this site visit will be incorporated into the layout and design of the restoration and management practices.
- CEC will finalize the site plan for the proposed development in accordance with the WVDEP/AML requirements. The plan will show the proposed grading features, access, and dimensions.
- CEC will prepare the final site grading plan, to include one-foot contours to represent all proposed site grading and spot elevations within the proposed disturbance.
- CEC will attempt to provide a balanced earthwork cut-to-fill ratio, and will prepare an adjusted earthwork volume calculation for cost estimating purposes. However, due to limiting site constraints, an earthwork balance may not be possible and some import of soil or soil haul-off may be necessary.

Information gleaned from onsite observation, the Geotechnical Investigation, LIDAR, and Aerial Photography will be entered into AutoCAD Civil 3D 2020. Surfaces will be used and manipulated to create a balance in cut/fill quantities in disturbed refuse and spoil areas. Grading plans will show 1' contours and will provide an estimated cut/fill quantity for grading activities.

3.1.6 Design Passive Treatment System Rehabilitation/Retrofit, Mitigate AMD Drainage

CEC will prepare an engineering design to address limited functionality of the existing passive AMD treatment system and other onsite AMD. Existing condition calculations based on collected water quality data will include acidity and metal loads, metal species characterization, oxygen consumption by metals precipitation, and iron oxidation rates. Treatment calculations will assess required alkalinity generation rates, chemical reagent consumption rates, generated precipitate volume, and required treatment best management practice (BMP) sizing and retention times.

Engineering will include either refurbishment of the existing passive treatment system, or redesign of a new system based on the results of chemical calculations. The passive treatment system will be designed with appropriately sized BMPs, treatment media, underdrains and conveyance piping to ensure sufficient alkalinity generation, metals oxidation, hydraulic conductivity, solids flushing, and particle settling. Other AMD may be present as groundwater seeps from pyritic mine spoil. These AMD sources will be conveyed to the refurbished passive treatment system, or will be addressed by independent passive treatment methodology.

3.1.7 Design to Stabilize Landslide

CEC will conduct an on-site reconnaissance to view any existing slips and the steeply sloping hillside to document existing conditions, site limitations, and understand the natural landscape. The findings of this site visit will be incorporated into the layout and design of the remediation of the landslide as well as restoration and management practices.

The reconnaissance would include viewing areas at the top of the landslide where abandoned mine entries may be currently discharging acid mine drainage (AMD) onto the slope. In addition, the site reconnaissance will include a review of existing and previous AML mine seals and conveyance systems, as well as scoping out possible site access for equipment. CEC will conduct a desktop review of available landslide mapping and soil maps to identify additional high risk areas near the area prior to the site visit.

CEC will plan and supervise a subsurface investigation to determine cause and aid in remedial design for the landslide. The location of planned test borings will be determined after the site reconnaissance.

CEC will provide a survey crew to perform the topographic survey necessary for design and subsequent construction drawings. If requested, planimetric, LIDAR or aerial photography may be utilized.

CEC will plan and implement a water chemistry testing program if needed based on the site reconnaissance.

CEC will develop a mitigation option for slope stabilization with construction plans and specifications.

CEC will develop plans and specifications for control of water at the site. Drainage control could include installation of drainage channels, underdrains, and/or other controls as deemed necessary by the engineer.

CEC understands that existing impoundments may be the cause of the drainage problems. Furthermore, an existing AML mine seal and conveyance system may be failing. As such, CEC will review the existing system and decide if a potential repair is possible, or if replacement of the system is warranted.

CEC will complete the layout of the reclamation of the disturbed areas and establish the proposed final elevations and grades for the site. CEC will finalize the site plan for the proposed development in accordance with the WVDEP/AML requirements. The plan will show the proposed grading features, access, and dimensions. CEC will prepare the final site grading plan, to include two-foot contours to represent proposed site grading and spot elevations within the proposed disturbance. CEC will attempt to provide a balanced earthwork cut-to-fill ratio, and will prepare an adjusted earthwork volume calculation for cost estimating purposes. However, due to limiting site constraints, an earthwork balance may not be possible and some import of soil or soil haul-off may be necessary. Information gleaned from onsite observation, the Geotechnical Investigation, site survey will be entered into AutoCAD Civil 3D 2018. Surfaces will be used and manipulated to create a balance in cut/fill quantities in disturbed refuse and spoil areas. Grading plans will

show 1' contours and will provide an estimated cut/fill quantity for grading activities.

CEC will prepare and submit necessary permits which are anticipated to include a West Virginia Department of Environmental Protection Division of Water and Waste Management (WVDEP-DWWM) National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit; and a West Virginia Department of Highways (WVDOT) MM-109 Encroachment Permit.

CEC will develop temporary and permanent revegetation plans for disturbed areas. Revegetation plans will utilize either mining reclamation standard revegetation specifications or a more diverse native non-invasive planting scenario including grass seed mixes, woody and herbaceous shrubs, and hardwood trees.

CEC will design access road improvements to provide all-weather construction access to the project areas. Design details will include appropriate geotextile, gravel base and surface, and will include hydrologic controls to effectively convey stormwater without road degradation. Access road construction will utilize existing grades present on the Project Site to ensure road stability while reducing earthwork quantities. The selected construction contractor will repair driveways, access roads, and county roads, as well as other landowner constructed appurtenances affected by construction activities.

CEC shall submit a digital *.pdf and three (3) paper copies of Preliminary Contract Plans for permitting and construction to WVDEP/AML. WVDEP/AML will review and comment. Any comments and all agreed-upon revisions shall be incorporated prior to submission to permitting agencies. Following permitting agency approval, consultant shall submit a digital *.pdf and three (3) paper copies of the Final Contract Plans and Specifications to WVDEP/AML. Specifications shall also be submitted in Microsoft Word *.docx format. This includes specifications for all proposed work and an engineer's opinion of probable cost for construction.

The Project Schedule will deliver preliminary design documents within sixty (60) calendar days of issuance of the Purchase Order.

3.1.8 Liner Installation (if applicable)

CEC will review the geotechnical data collected, locate soil within the borrow area containing a high clay content. Based on our experience working on abandoned mine lands it is unlikely that soil suitable for a homogeneous clay liner will be available within the mine refuse. Therefore, we are prepared and propose to use a Bentonite Enriched Soil (BES) mixture or a Geo-Synthetic Bentonite Liner to convey surface flows and prevent the loss of surface water into unconsolidated spoil or into the subsurface mine working. The liner will be designed to allow groundwater from hydrostatic pressure to flow into the channel during high groundwater conditions. Bentonite is a natural material formed from the weathering of volcanic ash which will not affect the water quality of receiving streams or the revegetation of riparian corridors.

The process for applying a BES mixture is as follows:

Support media amendment or commonly termed Bentonite Enriched Soils (BES) is a processed mixture of powdered bentonite clay with a support media. The support media should be free of peat or bulk organic material, logs or tree stumps, any industrial, commercial or domestic waste material, materials susceptible to spontaneous combustion, material in a frozen condition, any material likely to have a detrimental effect on the performance of the BES mixture.

The material for sealing is comprised of a homogenous blend of the support media and powdered bentonite with the addition of a bentonite slurry to create a substrate with enhanced low permeability characteristics. The performance standards required by this application are a material with permeability 1×10^{-10} cm/sec and a slump of 0-1".

In order to prepare a mix design for this material, laboratory bench tests should be performed for the various gradations of the support media. The support media will be dry blended with powdered bentonite to create a homogenous mixture of material and then add a bentonite slurry consisting of water and bentonite powder mixed to create a viscosity of 40 seconds using a Marsh Funnel Viscometer and yielding a unit weight of at least 64 lbs./cu. ft. and create a clay-like material with an 0-1" slump. This mixture should yield a material with sufficient plasticity to preclude the necessity to require direct compaction efforts. Laboratory permeability testing (ASTM-05084-00) will be performed periodically to ensure proper consistency.

Laboratory results should be recorded and placed with gradation curves and bentonite content percentages to be used in field to assure proper mix ratios. Field staff will be equipped with soil gradation screens and scales to accurately assess the gradation

percentage of bulk material. Bentonite slurry will be prepared using a colloidal mixture and tested only after full hydration has occurred. Thickness of the BES shall be determined during the design process.

3.1.9 Material Handling Plan (if applicable)

CEC will develop and design a plan to neutralize exposed or excavated coal refuse prior to backfilling or entombing the refuse "high and dry". Geotechnical and soil chemical data will be used to identify toxic material. Data collected during LiDAR topographic mapping and processed via AutoCAD Civil 3D 2020 will quantify volumes of toxic material requiring onsite disposal. The ideal area identified as above local drainage during the hydrogeological investigation will serve as the toxic material disposal area. Data collected during soil physical property analysis will identify sufficient quality clay material to be utilized in toxic material encapsulation. Considering the anticipated low quality of onsite borrow material, we are prepared and propose to use the BES mixture or Geo-Synthetic Bentonite Liner to encapsulate toxic material. Water diversion structures will be designed to divert surface water around or over toxic material disposal areas. Clay enriched encapsulation material will be filled under minimum one (1) foot of sufficient topsoil material to ensure sufficient revegetation.

3.1.10 Hydraulic & Hydrologic Analyses for Stormwater Management & Conveyance Structures

The purpose of this task is to prepare a stormwater management plan for collection, conveyance, and detention measures for post development conditions in accordance with the requirements of WVDEP/AML.

- CEC will perform a preliminary pre- and post-development hydrologic and hydraulic analysis to determine stormwater management requirements for post-development conditions.
- CEC will perform detailed engineering analysis and design for any stormwater collection, conveyance, and detention systems required for the site. CEC will prepare design drawings for the stormwater drainage system design to include plan view layout, cross sections (as needed) and construction details in accordance with WVDEP standards.

CEC will design open flow limestone ditches to capture surface runoff and ground water and direct that flow around or through the Project site. Every effort will be made to divert uphill runoff around proposed grades. All designed ditches will have engineered linings to provide stability and retard erosive forces. Limestone will be specified for all riprap lined ditches to add alkalinity to captured waters. Design pipes to transport captured ditch flows where necessary. CEC will design subsurface drains (where necessary) to safely convey ground water into constructed ditches or directly into receiving streams;

3.1.11 Revegetation Plan

CEC will develop temporary and permanent revegetation plans for disturbed areas. Revegetation plans will utilize either mining reclamation standard revegetation specifications or a more diverse native non-invasive planting scenario including grass seed mixes, woody and herbaceous shrubs, and hardwood trees.

3.1.12 Permitting

CEC can prepare and submit the following permit applications, if requested:

- USACE Regional General for AML or Nationwide 27;
- West Virginia Department of Environmental Protection Division of Water and Waste Management (WVDEP-DWWM) National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit;
- West Virginia Department of Highways (WVDOH) MM-109 Encroachment Permit;
- Endangered Species Act Section 7 and National Historic Preservation Act Section 106 Clearances;
- WV Department of Natural Resources Stream Activity and Stream Crossing;

The scope of services for these permit applications and clearances is described below:

USACE Regional General for AML or Nationwide 27

The Kempton Refuse Reclamation Project will likely qualify for Section 404 authorization under NWP 27 for Restoration, Establishment, and Enhancement Activities. CEC will prepare the NWP 27 Pre-Construction Notification (PCN) application package for the construction activities and will submit the PCN application to the USACE. Section 401 Water Quality Certification (WQC) is typically issued for NWP 27 by the WVDEP with the following condition: "Prior written approval is required from the West Virginia Department of Environmental Protection, Division of Water and Waste Management in concurrence with West Virginia Division of

Natural Resources (WVDNR) for non-coal mining related activities proposed under this permit." CEC will also submit copies of the PCN application to the WDEP and WVDNR for Section 401 WQC approval and concurrence.

The PCN application will include the supporting documents listed below:

- USACE application form (ENG Form 4345) for Department of the Army Permit;
- Final engineering design drawings and technical specifications;
- Adjoining landowner information;
- Stream and wetland delineation report with field data forms, photographs, and graphics including site location map, soils map, nation wetlands inventory (NWI) map, and wetland and stream delineation map;
- Copies of agency correspondence regarding threatened and endangered species and cultural resources.

The PCN application and supporting documentation will be submitted to the Client for review prior to submittal to the USACE, WVDEP, and WVDNR. The application and supporting documentation will be submitted to the USACE Pittsburgh District, Pittsburgh, Pennsylvania. CEC can pay the invoices associated with the USACE Section 404 permitting and invoice them to the Client as part of our professional services.

NPDES Construction Stormwater

CEC personnel will prepare the Stormwater Pollution Prevention Plan (SWPPP) utilizing the West Virginia Department of Environmental Protection (WVDEP) template. The plan will include the following:

- General location and site maps;
- Contact information for responsible party;
- Schedule for soil disturbing activities;
- Soil data sheet;
- Erosion and sediment control site maps and/or plan;
- Design sheets and design calculations;
- Stabilization practice schedule;
- Structural control sheet;
- Revegetation plan;
- Construction site inspection report template;
- Description of training and inspection content and frequency;
- Description of rare, threatened, and endangered species including agency comments;
- Description of architectural and archaeological resources including agency comments;

CEC personnel will prepare and submit the NPDES permit application through WVDEP Electronic Submission System (ESS). Submission will be conducted under ESS "Large Construction Activity 3 Acres or Larger." Submitted information will include:

- General project information;
- Preparer's information;
- Site information;
- Limit of disturbance ArcGIS shape file;
- Earthwork volume calculations;
- Construction timelines and sequence;
- Sediment controls;
- Site maps and discharge area maps;
- Explanation of stormwater management practices; and
- Supplemental information.

Multiple permit application submissions resulting from WVDEP procedural changes will be at an additional cost. CEC can pay the invoices associated with the NPDES Construction Stormwater Permit and invoice them to the Client for reimbursement as part of our professional services.

CEC will prepare a NPDES Notice of Termination (NOT) form at the end of the project. These forms are required by WVDEP in order to assign responsibility for implementation of the NPDES permit regulations from the owner to the parties responsible for the earthmoving.

WVDOT MM-109

CEC will complete the West Virginia Department of Transportation (WVDOT) Division of Highways (DOH) MM-109 Encroachment Permit to enter upon, under, over or across the state roads of West Virginia. The required WVDOT MM-109 Bond will be the responsibility of WVDEP/AML or the selected Construction Contractor. CEC will prepare all required engineering drawings, details and specifications required for WVDOT for acquisition of the MM-109 Permit.

Endangered Species Act Section 7 and Section 10 / National Historic Preservation Act Section 106 Clearances;

In order for the USACE to issue project authorization under Section 404 of the Clean Water Act, the project must also comply with Section 7 of the Endangered Species Act and Section 106 of the National Historic Preservation Act. CEC will prepare and submit project clearance requests to the U.S. Fish and Wildlife Service (USFWS) and West Virginia Division of Natural Resources (WVDNR) for threatened and endangered species database review and to the State Historic Preservation Office for a cultural resources database review.

The USFWS Section 10 Permit pertains to a project location where a species specific survey identified the presence of endangered species and implementation of the project will impact endangered species and/or habitat. This scenario requires a USFWS Section 10 Permit, known as an "Incidental Take Permit." CEC will not complete this task and has not included a cost estimate. If the Section 10 permit is required, CEC will provide the Client with a separate scope and cost for these services.

WV Department of Natural Resources Stream Activity and Stream Crossing;

CEC will prepare a Stream Activity Application to obtain the required Right of Entry Permits required for all streams associated with the project. CEC will prepare the OLS Stream Activity Permit application form and the supporting documents listed below:

- Site Location Map; and
- Stream Activity Summary Table.

The application and supporting documentation will be submitted to the WVDNR's OLS in Charleston, West Virginia. CEC can pay the invoices associated with the stream activity application, and invoice them to the Client as part of our professional services.

3.2 DESIGN PART II: ECOSYSTEM RESTORATION

3.2.1 Ecosystem Restoration Services

CEC understands the complex nature of ecosystems and employs a multidisciplinary approach to ecosystem restoration. Our staff is comprised of more than 90 scientists who are dedicated to our Ecological Practice and the restoration of streams and wetlands. Working closely with our Civil/Site Engineering and Water Resources practices, our aquatic ecologists, botanists, geomorphologists, wetland scientists, biologists, and engineers provide a synergy that brings cost-effective solutions to our clients with a functional ecological uplift to our projects. Our experience shows a strong emphasis on watershed-based restoration projects. Cooperatively, our 23 offices have completed more than 100 ecosystem restoration projects for a total of 2,500 acres of wetlands and 70 miles of streams.

As an industry-focused consulting firm, we identify the balance between development and environment; therefore, we are dedicated to providing businesses with peace of mind through the state and federal permitting process. Our ecological team has the in-depth knowledge of regulatory requirements and up-to-date project experience to produce positive, timely results.

CEC's Ecosystem Restoration services include:

- Stream and Wetland Restoration Design
- Site Selection and Evaluation
- Fluvial Geomorphology
- Natural Channel Design

- Wetland Water Budgets
- Mitigation Planning
- Riparian and Wetland Planting Specifications
- Landscape Restoration
- Geomorphic Restoration
- Agronomic Evaluations
- Revegetation of Disturbed Landscapes
- Invasive Plant Management
- Watershed Planning
- Regulatory Permitting
- Aquatic Biological Monitoring (Fish and Benthic Macroinvertebrates)
- Rare and Endangered Species Surveys (Plants, Bats, Birds, Fish, Mussels)
- Geographic Information and Database Management Systems

The CEC stream and wetland restoration team will use natural channel design to create a functional, self-sustaining stream system that provides valuable hydraulic, geomorphic, and ecologic functions. We incorporate wetland restoration into our stream restoration designs by retaining ox-bow and back channels from channel relocations, designing overbank floodways to connect and enhance floodplain wetlands, and creating depressional wetlands and vernal pools from soil borrow areas. The CEC stream and wetland restoration team is uniquely qualified because all of our scientists have input into the designs, producing restoration that identifies aquatic life history, wildlife, riparian vegetation, sediment transport, fluvial geomorphology, and hydrology. We have performed functional assessments on many of our restoration projects, and documented which have proven to produce ecological uplift to the community and improvements in aquatic life use. Each phase of a CEC stream and wetland restoration will have specialized staff performing the tasks, and those key individuals will have input throughout the life of the project.

We have the capabilities to provide our clients with ecosystem restoration services from project conception, through design and construction, to obtaining final release by agencies. The following section presents our approach to delivering restoration services for these various phases of project development.

3.2.2 Geomorphic Survey

A Rosgen Level III Morphological Assessment will be conducted in accordance with the methodologies presented in "A Classification of Natural River Systems" (Rosgen, 1994). During the morphological assessment, CEC will document observed bankfull indicators and will survey them both in cross-section and profile, where possible. It may be necessary to utilize other means to verify bankfull stage throughout the project. Estimates of bankfull discharge will then be determined using standard open channel flow equation(s). Other hydraulic parameters will be calculated to further analyze existing conditions and to provide an evaluation tool during the restoration design phase. Additional geomorphic features such as inner berms, thalweg, top of banks, and water surface will be surveyed to complete a detailed stream survey that can be merged with the aerial LIDAR of the floodplain proposed in Aerial Mapping and Photography section.

Reference reaches of similar stream types may be identified and surveyed to establish reference conditions for design criteria. The reference reaches may be upstream and/or downstream of impaired reaches or on unimpaired streams in the same physiographic province. Geomorphic features such as bankfull, inner berms, thalweg, and water surface will be surveyed to complete a detailed reference survey.

Hydraulic and Hydrologic Analyses for Stream Restoration

Hydrologic and hydraulic modeling will be completed for the project reach and tributaries scheduled for restoration. The objectives for the stream hydrologic and hydraulic modeling are as follows:

- Evaluate detailed pre vs post-project bankfull and flood event shear stress and velocities for stream restoration design.
- Calibrate stream restoration design discharge validation tools.
- Produce detailed comparative depth grid inundation mapping based on the pre and post-project conditions.
- Produce detailed comparative shear stress, velocity, and water depth mapping based on the pre and post-project conditions.
- Assess scour and deposition trends including backwater situations from island bars, bridge/culvert crossings, and other obstructions.

CEC will develop Two-Dimensional (2D) Hydraulic conditional models to compute the baseline hydraulic conditions for normal flow, typical precipitation frequency floods, and simulated bankfull events. Precipitation data will be estimated utilizing publicly available data in the subject watershed. This data will be used to create peak flows and hydrologic runoff hydrographs to generate unsteady peak and continuous flows for 24-72 hour flood simulations. To calibrate the hydraulic model, hydrologic analysis of the watershed would be completed using multiple data sets to determine flood stages and recurrence interval. Examples of methods that may be used include, Federal Emergency Management Agency (FEMA) Flood Insurance Studies (FIS), United States Geological Survey (USGS) regression equations, USGS stream gage data, or other published sources. CEC will determine if the restoration designs will have adverse impacts on the floodplain and implement iterative changes within the design criteria to reduce impacts.

CEC routinely implements 2D models to add modeling detail to overbank flooding flows in the floodplain and non-traditional channel flow conditions. 2D hydraulic model use the depth-averaged equations of motion to provide outputs of hydraulic characteristics at each cell in the computation mesh. Hydraulic outputs including depth and shear stress are displayed on maps providing for more detailed stage and flow information compared to One-Dimensional Modelling calculated at individual cross sections. The mapping of the 2D flow areas are based on the detailed underlying terrain providing for an increased level of detail. 2D flow animations and 3D conceptual rendering animations can be used for public meetings and education outreach presentations to bring the restoration reach to life.

CEC will summarize the hydrologic and hydraulic analysis in report format to support the stream design plan including, executive results summary, conditional narrative, tabular data results, watershed maps, inundation maps including depth grids, velocity, and shear stress, modeling expectations and limitations. The technical report will also include modeling simulation videos displaying the flow regime trends, peak flow inundation and velocity particle tracing.

3.2.3 Wetlands and Waterways Identification and Delineation

CEC will identify, classify, and delineate streams and other waters at the Project Site. Streams and other waters, such as ponds, seeps, springs, etc., will be identified by the presence of an ordinary high water mark. An "ordinary high water mark" is defined at 33 CFR Part 328.3(e) Guidance for identifying the ordinary high water mark (OHWM) in streams and other water bodies is given in USACE Regulatory Guidance Letter No. 05-05. Streams will be classified as perennial, intermittent, and ephemeral as defined in the "2012 Nationwide Permits, Conditions, District Engineer's Decision, Further Information, and Definitions" published in the Federal Register on February 21, 2012.

CEC aquatic biologists will investigate potential streams within the Site to locate the approximate upstream and downstream limits of perennial, intermittent, and ephemeral stream reaches. In the absence of established federal or state regulatory protocols for stream classification, CEC will use multiple lines of evidence and field indicators to determine perennial, intermittent, and ephemeral stream reaches, including estimated stream flow, water depth, channel dimensions (bankfull and OHW width and depth), evidence of groundwater seepage and sustained high water levels in the channel (e.g., water marks, silt deposits, scour and wrack lines, etc.), fluvial geomorphic features (riffles, pools, point bars, active floodplains, etc.), substrate composition, and observations of vegetation, aquatic macroinvertebrates, and fish.

Stream and waters determination data will be recorded on field data forms and each stream segment and water will be photographed. For streams and linear water features less than 15 feet wide, CEC will mark, with labeled surveyors flagging, the center of the channel or linear feature and the approximate location of a change in classification or type (e.g., perennial, intermittent, etc.). For streams and features greater than 15 feet wide, CEC will mark both banks of the stream to define the channel and both sides of the linear feature. For other waters, CEC will mark the limits of the OHW mark.

3.2.4 Wetlands

CEC will identify and delineate wetlands at the site in accordance with the routine determination methodology described in the 1987 U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (USACE Manual), supplemented by the following procedures and information: 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (USACE Supplement), 2014 National Wetland Plant List, and USDA 1991 Hydric Soils of the United States.

CEC will conduct a site inspection to determine wetland presence based on the dominance of hydrophytic plant species, the presence of hydric soil indicators, and evidence of wetland hydrology as described in the USACE Manual and Supplement. CEC will perform

the following activities: (1) identify plant communities on the site; (2) select a representative test site within each plant community and identify the dominant plant species within each plant stratum (trees, sapling/shrubs, ground cover, and woody vines); (3) sample soils using a tile spade or auger; (4) inspect the test site for indicators of wetland hydrology; and (5) determine if the area meets the criteria for a wetland. If an area is determined to be a wetland, an additional non-wetland test site will be sampled to determine the wetland-non-wetland boundary.

Dominant plant species, soils descriptions, and hydrology indicators used in making the wetland determination will be recorded on routine wetland determination data forms for both wetland and non-wetland test sites. CEC will prepare a sketch map of each wetland, and photograph each wetland and representative views of non-wetland plant communities. CEC will delineate the boundaries of each wetland using changes in topography, vegetation, soils, and hydrology, and will mark the boundary with consecutively-numbered surveyor's ribbon.

3.2.5 Identification of Boundary Locations

During the field delineation, CEC will locate the boundaries of wetlands, streams, and other waters marked in the field using aerial topographic mapping and Trimble® Geo-XT or Geo-XH Global Positioning System (GPS) equipment. CEC will check the GPS data to determine if the horizontal precision is suitable for delineating wetland and waters boundaries. If not, CEC will notify you that the boundaries will need to be located by surveyors and will provide a separate scope and cost for this service. The GPS boundary locations will be used to prepare preliminary mapping for site planning purposes.

3.2.6 Reporting

After completing the field delineation and classification of streams and wetlands within the study area, CEC will prepare a wetland and stream delineation report. The report will include a description of the classification and delineation methods, stream determination and wetland delineation field data forms and photographs, tabulation of the type and lengths of each stream, wetland area tabulation, and a stream and wetland delineation map showing the location, extent, and classification of each stream or wetland within the Site. These forms will be provided on DVDs to the agencies who will accept that in lieu of a hard copy in order to reduce report production costs.

3.2.7 GIS Analysis

GIS analysis will be completed following the collection of the LiDAR and aerial imagery. From the LiDAR, Digital Elevation Models (DEM) will be used to create surfaces, hillshade for topographic relief, flow accumulation grids, etc. This will allow CEC the ability to accurately estimate cut and fill volumes and perform terrain analysis while developing surface water conveyances and stream and wetland designs.

3.2.8 Natural Stream Design

A detailed stream assessment of the existing conditions will be conducted to determine the most suitable approach for a sustainable project. All of our projects come complete with geomorphic, biologic, and hydraulic/hydrologic assessments. For stream restoration projects, CEC routinely collects samples of macroinvertebrates, fish communities, aquatic macrophytes, and riparian vegetation, though this is not anticipated on the Pine Bluff (Wilson) Refuse project.

CEC will implement a geomorphic approach to the natural channel design project. Dimension, Pattern, profile, are surveyed and evaluated to determine the channel evolution pattern. Reference reach data gathered during the geomorphic survey task will be used as a "blueprint" for producing design criteria. The geomorphic data is then evaluated along with aquatic species life history and habitat surveys to produce ecologically-functional design criteria.

Sediment transport will be evaluated during the design phase to model the transport capacities and discharge. CEC uses the nationally-recognized RIVERMorph® stream restoration software to analyze sediment transport. CEC has a full complement of hydrologic and hydraulic modeling software including, but not limited to: SRH2D, HEC-HMS, HEC-RAS, HEC-2, HydroCAD, Hydraflow, HY-8, TR-20, USGS-NFF and VTPSUHM.

USGS regression equations, stream gage data, and regional curves are used and produced as validating tools for design capacity and discharge.

Detailed grading plans and three-dimensional (3D) stream designs will be completed in AutoCAD Civil 3D 2020 to provide accurate earthwork quantities and precision during construction. The 3D stream design will include multi-faceted surfaces detailing the stream riffles, pools, point bars, flood plain, and terraces. The 3D design will be provided in AutoCAD .dwg format for use by the successful contractor to use on GPS-enabled construction equipment. Additionally, one site inspectors may want to retain the files for construction quality assurance to check lines and grades using survey grade GPS.

3.2.9 Construction Drawings

CEC will use the approved design criteria to prepare preliminary design plans that are suitable to permit the proposed restoration project. Technical specifications and installation instructions will be included with the details.

The preliminary design documentation will include: the morphological data; an assessment photograph log; the summaries pertaining to the sediment transport analysis (method, rationale, and results) and hydrology and hydraulics; and an opinion of probable construction cost.

CEC shall submit a digital *.pdf and three (3) paper copies of Preliminary Contract Plans for permitting and construction to WVDEP/AML. WVDEP/AML will review and comment. Any comments and all agreed-upon revisions shall be incorporated prior to submission to permitting agencies. Following permitting agency approval, consultant shall submit a digital *.pdf and three (3) paper copies of the Final Contract Plans and Specifications to WVDEP/AML. Specifications shall also be submitted in Microsoft Word *.docx format. This includes specifications for all proposed work and an engineer's opinion of probable cost for construction.

3.3. FINAL DOCUMENTATION / SUBMISSIONS

3.3.1 Design Part I and II: Final Design Drawings

CEC will revise the preliminary design of both Part I and Part II based on compilation of written comments provided by WVDEP/AML and the permitting agencies. Revisions will be made to the preliminary design plan sheets and will primarily consist of finalizing design items (i.e. final structure locations, stream geomorphic data, project sequencing, etc.), technical details and specifications, construction quantities (line item details will be provided at this stage), and an estimate of the probable cost of construction. CEC will then submit three (3) paper copy sets of full-size (22" X 34") plan sheets and a digital copy in *.pdf to WVDEP/AML along with AutoCAD files that may be used for machine control construction. CEC will also provide one (1) paper copy and a digital copy in *.pdf and Word (*.docx) of the revised technical specifications, quantities estimate, and opinion of probable cost for construction.

4.0 References

We encourage WVDEP to contact the following client contacts to discuss our previous performance on similar projects. CEC has performed numerous landslide remediation projects with the following clients.

Mr. Troy Anderson

Ecosystem III Credit Co., LLC
Assistant Director of Operations
5550 Newbury Street, Suite B
Baltimore, MD 21209
608.212.6607
Email: troy@ecosystempartners.com

Mr. Robert Stuart

Genesis Partners
Director of Planning/Engineering
600 Marketplace Ave. STE 350
Bridgeport WV 26330
304.842.0624
Email: stuartrf@genesis-partners.com

Ms. Judy Rodd

Friends of Blackwater
Director
571 Douglas Rd
Thomas, WV 26292
304.345.7663
Email: info@saveblackwater.org

Madison Ball

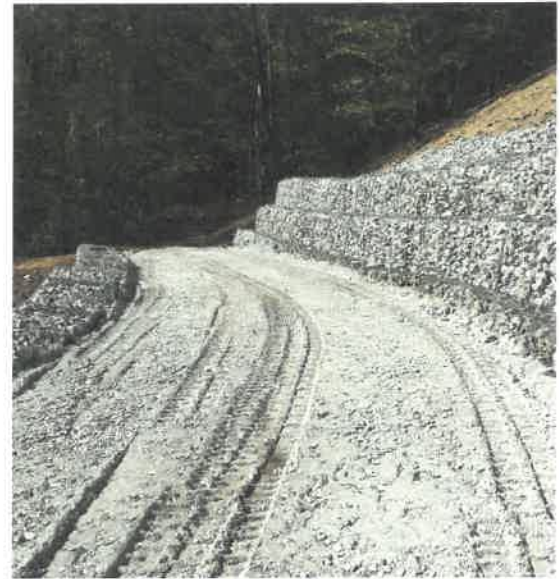
Friends of the Cheat, Inc.
1343 North Preston Highway
Kingwood, WV 26537
304.329.3621, Ext. 4

John Sanders, P.E.

Highland Engineering & Surveying, Inc.
1426 Memorial Drive
Oakland, Maryland 21550
301.334.6185

Jason White

Appalachian Stream Restoration & Reclamation Specialists
48 Wandling Road
Sumerco, West Virginia 25567
304.756.3066



John Nelson

West Virginia Conservation Agency- Lewisburg Field Office
179 Northridge Drive
Lewisburg, West Virginia 24901
304.941.5519

John Kirby

City of Frostburg
59 East Main Street
Frostburg, Maryland 21532
301.689.6000

**Appendix A -
AML Consultant Qualification Questionnaire**

AML CONSULTANT QUALIFICATION QUESTIONNAIRE

Attachment "B"

PROJECT NAME Kempton Refuse	DATE (DAY, MONTH, YEAR) 10 September 2020	FEIN 25-1599565
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1. FIRM NAME Civil & Environmental Consultants, Inc.	2. HOME OFFICE BUSINESS ADDRESS 333 Baldwin Rd, Pittsburgh PA 15205	3. FORMER FIRM NAME N/A
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4. HOME OFFICE TELEPHONE 412.429.2324	5. ESTABLISHED (YEAR) 1989	6. TYPE OWNERSHIP <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Joint-Venture	6a. WV REGISTERED DBE Disadvantaged Business Enterprise) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE
Bridgeport Office | 600 Marketplace Ave., Suite 200, Bridgeport, WV 26330 | 304.933.3119 | Jane Hicks

8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM Kenneth Miller PE CEO Dan Szwed PE COO Dennis Miller PS Vice President & Office Lead	8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS Kow Eshun Principal Geotech 304-848-7142
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9. PERSONNEL BY DISCIPLINE

83	ADMINISTRATIVE	83	ECOLOGISTS	14	LANDSCAPE ARCHITECTS	12	STRUCTURAL ENGINEERS
0	ARCHITECTS		ECONOMISTS	9	MECHANICAL ENGINEERS	144	SURVEYORS
15	BIOLOGIST	5	ELECTRICAL ENGINEERS		MINING ENGINEERS	8	TRAFFIC ENGINEERS
61	CADD OPERATORS	162	ENVIRONMENTALISTS		PHOTOGRAMMETRISTS	191	OTHER
7	CHEMICAL ENGINEERS		ESTIMATORS		PLANNERS: URBAN/REGIONAL		
276	CIVIL ENGINEERS	37	GEOLOGISTS	1	SANITARY ENGINEERS		
18	CONSTRUCTION INSPECTORS		HISTORIANS	3	SOILS ENGINEERS		
	DESIGNERS	1	HYDROLOGISTS		SPECIFICATION WRITER	1160	TOTAL PERSONNEL

TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE:
7 WV Professional Engineers in Bridgeport (40 companywide)

*RPEs other than Civil and Mining must provide supporting documentation that qualifies them to supervise and perform this type of work.

10. HAS THIS JOINT-VENTURE WORKED TOGETHER BEFORE? Yes No

NAME AND ADDRESS: Novel Geo-Environmental, LLC 650 MacCorkle Avenue West St. Albans, WV 25177	SPECIALTY: geotechnical investigation services including drilling investigation and technical reporting of findings	WORKED WITH BEFORE <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
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NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
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NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No

A. Is your firm's personnel experienced in Abandoned Mine Lands Remediation/Mine Reclamation Engineering?

YES Description and Number of Projects:

1. Island AMD Passive Treatment System (non-BFS) - iron oxidation, acid neutralization, metal precipitation/collection, hydrologic conveyances
2. North Taylor AMD Passive Treatment System (non-BFS) - acid neutralization, mixing basin, aerobic wetlands, hydrologic conveyances, revegetation
3. Virginia DMME AMD Passive Treatment System (non-BFS) - sulfate reducing bioreactor, settling pond, aerobic wetlands

CEC personnel have successfully completed 20 acid mine drainage evaluation and abatement design projects.

NO

B. Is your firm experienced in Soil Analysis?

YES Description and Number of Projects:

CEC has routinely completed soil analysis for the Oil & Gas Industry focusing on VOCs, PAHs, Phthalate Esters, Petroleum Compounds, Metals, Anion, and Radionuclides. CEC has routinely completed soil analysis on AML for stream restoration focusing on ABA, Pyritic Sulfur, and Nutrient Content. CEC has completed soil analysis on approximately 50 projects.

NO

C. Is your firm experienced in hydrology and hydraulics?

YES Description and Number of Projects:

1. Shinns Run Portals (WVDEP) - field surveying, subsurface investigations of impounded mine pools, records review, HEC-RAS hydrologic evaluation, streambed seals, ditchwork, piping, subsurface drains, stream bank protection, roadbed protection, soil testing, preliminary and final designs / construction plans, dewatering operation, mine drainage treatment, opinion of cost, bid schedule, calculation brief, meeting attendance
2. Pageton (Lambert) Portals (WVDEP) - Reclamation design of coal refuse pile with 51,000 cubic yards of excavation, 24 wet mine seals, 13,700 L.F. sediment control, 1,600 L.F. ditchwork, piping, streambank protection, 24 acres revegetation, topographic surveying, construction mapping, soil testing, hydraulic studies and design, preliminary and final design, construction plans and specifications, engineers cost estimate, bid schedule, calculations brief, onsite preliminary design/pre-bid/pre-construction meetings, reporting and invoicing
3. Birds Creek Number 4 (WVDEP) - Reclamation design of coal refuse pile with 35,000 cubic yards of excavation, 8 wet mine seals, 5 bat gate designs, 18 acres revegetation, topographic surveying, construction mapping, soil testing, hydraulic studies and design, preliminary and final design, construction plans and specifications, engineers cost estimate, bid schedule, calculations brief, onsite preliminary design/pre-bid/pre-construction meetings, reporting and invoicing.

CEC personnel have successfully completed numerous hydrology and hydraulics projects associated with bridges, box culverts, piping, ditchwork, and sediment ponds. CEC personnel have completed 60 AML related hydrology and hydraulics projects.

NO

D. yo firm oduc ts Aer Phc raph and olop itou app

YES Description and Number of Projects: CEC routinely collects LIDAR topographic data and aerial photography on minimum 200 projects. LIDAR data is processed into contour mapping with 1.0 ft. resolution.

NO

E. Is your firm experienced in domestic waterline design? (Include any experience your firm has in evaluation of aquifer degradation as a result of mining.)

YES Description and Number of Projects: CEC completes extensive water transfer projects for the oil & gas industry and municipal water supplies on approximately 50 projects.

NO

F. Is your firm experienced in Acid Mine Drainage Evaluation and Abatement Design?

YES Description and Number of Projects: CEC routinely assesses AMD and designs passive and active treatment management practices for treatment of acid mine drainage. CEC has completed approximately 20 AMD remediation projects. CEC employs mining geochemists with nearly 30 AMD remediation projects in prior employment.

NO

13. ERS(HI Y S EME F P IPA AND DCIA RE SIB OR PRO T D N (hist mple) data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.) Eshun, Kow, PE Bridgeport, WV Office	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

Brief Explanation of Responsibilities
Mr. Eshun is a Principal with in CEC's Bridgeport Office and will be responsible for geotechnical aspects as well as monitoring project progress.

EDUCATION (Degree, Year, Specialization)
B.S., Civil Engineering, Kwame Nkrumah University of Science and Technology, 2005
M.S., Geotechnical Engineering, The University of Akron, 2013

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS American Society of Civil Engineers, Project Management Institute, Deep Foundations Institute	REGISTRATION (Type, Year, State) Professional Engineer - TX [REDACTED] KY [REDACTED] MD 50794 WV [REDACTED] PA [REDACTED] VA [REDACTED] OH PE [REDACTED]
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NAME & TITLE (Last, First, Middle Int.) Calkins, Randolph M., PS Bridgeport, WV Office	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 40	YEARS OF AML RELATED DESIGN EXPERIENCE: 40	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

Brief Explanation of Responsibilities
Mr. Calkins will act as Senior Consultant in the development of the refuse reclamation designs.

EDUCATION (Degree, Year, Specialization)
A.S., Surveying Engineering, The Pennsylvania State University

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State) Professional Surveyor, West Virginia [REDACTED]
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NAME & TITLE (Last, First, Middle Int.) Linder, Gregory S., PE Bridgeport, WV Office	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 8	YEARS OF AML RELATED DESIGN EXPERIENCE: 13	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

Brief Explanation of Responsibilities
Mr. Linder will serve as an Engineer on this project. He will oversee all land reclamation aspects of the project.

EDUCATION (Degree, Year, Specialization)
B.S., Civil Engineering, West Virginia University
B.S., Biology, Fairmont State College

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State) Professional Engineer, 2003, West Virginia Professional Engineer, 2006, Pennsylvania Professional Engineer, 2006, Kentucky
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NAME & TITLE (Last, First, Middle Int.)		YEARS OF EXPERIENCE	
Denicola, Timothy A., CFM Bridgeport, WV Office		YEARS OF AML DESIGN EXPERIENCE: 5	YEARS OF AML RELATED DESIGN EXPERIENCE: 8
YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:			
Brief Explanation of Responsibilities Mr. Denicola will conduct water quality and soil chemical sampling			
EDUCATION (Degree, Year, Specialization) M.S., 2013, Geology, West Virginia University B.S., 2006, Chemistry, Clarion University of Pennsylvania			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS Member of several northern WV non-profit watershed associations		REGISTRATION (Type, Year, State) Erosion and Sediment Control Responsible Personnel (Green Card), 2015, Maryland, No. [REDACTED] State Highway Administration Erosion and Sediment Control (Yellow Card), 2015, Maryland, No. [REDACTED] Association of State Floodplain Managers (ASFPM) Certified Floodplain Manager (CFM), No. [REDACTED]	
NAME & TITLE (Last, First, Middle Int.)		YEARS OF EXPERIENCE	
Hicks, Jane Bridgeport, WV Office		YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:
YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:			
Brief Explanation of Responsibilities Ms. Hicks will serve as the project manager and oversee all project related activity. She provides the team with over 20 years of experience in geotechnical engineering.			
EDUCATION (Degree, Year, Specialization) B.S., Mining Engineering, West Virginia University, 1981 M.A., Education, West Virginia University, 1989			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
NAME & TITLE (Last, First, Middle Int.)		YEARS OF EXPERIENCE	
Stewart, Robert Bridgeport, WV Office		YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:
YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:			
Brief Explanation of Responsibilities Mr. Stewart will provide ecosystem restoration design support.			
EDUCATION (Degree, Year, Specialization) B B.S., Civil Engineering, Tennessee Technological University, 2009 M.S., Civil Engineering, University of Kentucky, 2009 Ph.D., Civil Engineering, University of Kentucky, 2014			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State) Engineer in Training TN [REDACTED]	

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES

1. AutoCAD Civil 3D
2. ESRI ArcGIS
3. Topcon, Nikon, and Trimble Robotic Total Stations
4. Topcon, Trimble RTK-GPS
5. Leica Terrestrial LIDAR 3D Scanner
6. Velodyne Mobile LIDAR (ground and aerial based)
7. DJI small unmanned aircraft system (sUAS)
8. Topcon, Nikon automatic levels
9. Trimble GeoExplorer 6000 Series
10. YSI ProPlus Multi-parameter Probe
11. Marsh McBirney Flow Meter
12. Hanna HI 98703 Turbidity Meter
13. Hanna HI 99121 Direct Soil pH Meter
14. Submersible and Peristaltic Pumps
15. Mini RAE 3000 Portable Handheld VOC Monitor
16. Corel 98 Suite
17. Microsoft Office Suite
18. North American Green Erosion Control Blanket Software
19. KY Pipe Water and Sewer Line Software
20. Bentley MicroStation with InRoads

15. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Chiselfinger Ridge Road Upgrade Wetzel County Route 20/1 and 28/1	Antero Resources Corporation	Roadway widening and stormwater system improvement	N/A	90%
River Road Slips Monongalia County, WV	WVDOH District 4	Slip repair and roadway rehabilitation	N/A	20%

TOTAL NUMBER OF PROJECTS:

TOTAL ESTIMATED CONSTRUCTION COSTS:

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
TS&T Site Phase II Assessment	WVDEP, Office of Abandoned Mine Lands 601 57th St. SE, Box 20 Charleston, WV 25340	\$500,000 - \$3,000,000	2015	Yes
Huff Creek Watershed Stream Restoration	WVDEP, Office of Abandoned Mine Lands 601 57th St. SE, Box 20 Charleston, WV 25340	\$460,055	2015	Yes
Hodgesville (Wright) Mine Blowout	WVDEP, Office of Abandoned Mine Lands 601 57th St. SE, Box 20 Charleston, WV 25340	\$500,000 - \$3,000,000	2015	Yes
Jefferson County Leachate Tank Study	WVDEP, Office of Abandoned Mine Lands 601 57th St. SE, Box 20 Charleston, WV 25340	NA	2015	Yes
Tub Run Highwall and Refuse Phase III	WVDEP, Office of Abandoned Mine Lands 601 57th St. SE, Box 20 Charleston, WV 25340	TBD	2017	No
TS&T Site Phase II Assessment	WVDEP, Office of Abandoned Mine Lands 601 57th St. SE, Box 20 Charleston, WV 25340	\$500,000 - \$3,000,000	2015	Yes
Oxbow Mitigation Bank	EIP III Credit Co., LLC 5550 Newbury St, Ste B Baltimore, MD 21209	\$5,999,095	2018	
Snake Run Adaptive Management Stream Restoration	West Virginia Conservation Agency 179 Northridge Drive Lewisburg, WV 24901	\$100,000		Design 100% Construction 100%
Lower Dempsey Stream Restoration on AML	Ecosystem Investment Partners, LLC 5550 Newbury St, Ste B Baltimore, MD 21209 Canaan Valley Institute, Inc. 494 Riverstone Rd Davis, WV 26260	\$5,200,000		Design 100% Construction 100%
Howards Creek Stream Restoration	West Virginia Conservation Agency 179 Northridge Drive Lewisburg, WV 24901	\$385,440	2018	

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH
Brushy Fork Mitigation Bank, Harrison County, WV		North State Environmental Inc. 2889 Lowery St. Winston-Salem NC 27101	2018	\$4,500,000	Survey \$70,000
Jackson County Middle School -Site Development		Omni Associates 207 Jefferson St. Fairmont, WV 26554	2018	TBD	Omni Associates
Wesco Building Renovation, Site Development		Omni Associates 207 Jefferson St. Fairmont, WV 26554	2018	TBD	Omni Associates
WVSP Wetlands Mitigation Design		Omni Property Companies 23205 Mercantile Rd Beachwood OH 44122	2018	TBD	Omni Associates
Bridgeport Rec Center, Site Development		Omni Associates 207 Jefferson St. Fairmont, WV 26554	2019	TBD	Omni Associates

18. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.
 Civil & Environmental Consultants, Inc. (CEC) personnel have experience with esoteric aspects of mine land reclamation and mine water remediation. CEC does not employ generic remediation strategies, but assesses and evaluates critical details of water chemistry, reaction dynamics, soil properties, hydrologic properties, regional geology, and client and landowner needs. CEC personnel have decades of experience in the reclamation community, familiarity with modern reclamation techniques, and access to a suite of engineering design/geochemical software. Site grading, volumetric analysis, and hydraulic assessments constitute a bulk of work completed by CEC Bridgeport. CEC presents an interdisciplinary team utilizing a data and client driven approach to mine land reclamation and mine water remediation.

19. The foregoing is a statement of facts.

Signature:  Title: Principal

Date: September 3, 2020

Printed Name: Kow Eshun, PE

**Appendix B -
AML and Related Project Experience Matrix**

AML and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C=Corp. P=Personnel*	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS														PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional					
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation/Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/ Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment/ Structure Removal	Stream Restoration	Geotechnical/Stability	Greg Linder, P. E. Principal	Randy Calkins, P. S. Designer	Jason Litter, P. S. Staff Engineer	4 Survey Crews	5 CADD Operators
McAlpin Portals and Drainage	C		X	X	X	X			X		X	X		X		X		M		P	P	P
Hodgesville (Wright) Mine Blowout	C		X	X	X	X			X		X	X		X				M		P	P	P
Arlington (Gain) Highwall*	C		X			X					X							M		P	P	P
Camden (Hartley) Dangerous Landslide*	C		X			X					X	X				X		M		P	P	P
Shinns Run Portals*	C			X	X	X			X		X	X		X		X		M		P	P	P
Special Rec. Multiple Projects****	C		X	X	X	X			X		X	X		X		X		M		P	P	P
Norton Highwall #1*	P		X	X	X	X					X			X	X			M	P	P	P	P
Tub Run Highwall and Refuse Phase II*	P		X	X	X	X				X			X	X					P		P	P
Tub Run Highwall and Refuse Phase I*	P		X			X					X			X					P		P	P
Newburg Waterline Feasibility Study*	P					X						X		X				M				P
Point Mtn. Waterline Feasibility Study*	P					X						X		X				M				P
Greenbrier Hollow Refuse*	P		X	X	X	X					X			X	X				P		P	P
Sauls Run (Carpenter) Landslide*	P		X	X	X	X					X			X	X		X		P	P	P	P
Pageton (Lambert) Portals*	P		X	X	X	X					X			X	X				P		P	P
Birds Creek #4*	P		X	X	X	X					X			X	X				P		P	P
Church Creek/Manown Highwall*	P		X		X	X					X			X	X				P		P	P
Racine (Bradshaw) Portals*	P			X	X	X					X			X	X				P		P	P
Hampton #4 Maintenance*	P		X			X					X	X			X	X			P	P	P	P
Howesville Sites*	P		X	X	X	X				X	X	X		X	X	X		M	P		P	P
Sandy Run Highwall and Portals*	P		X	X	X	X				X	X	X		X	X	X		M	P		P	P
Wilsie-Rosedale Waterline Feasibility I.D. # 324*	P					X						X		X		X						P
Laurel Valley (Daniels) Landslide*	P		X			X					X					X		M	P	P	P	P
Price Hill Airshaft/Buildings*	P			X	X	X					X	X		X	X	X				P	P	P
Gladly Fork AMD Trmt. Plant.****	P			X		X					X	X	X	X		X		M		P	P	P
Weaver Portals, Ph. I & II*	P		X	X	X	X			X		X	X	X	X	X	X		M	P	P	P	P
Nixon Run AMD*	P		X	X	X	X					X	X		X	X	X				P	P	P

AML and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C=Corp. P=Personnel*	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS														PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional							
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/ Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment/ Structure Removal	Stream Restoration	Geotechnical/Stability	Greg Linder, P.E. Principal	Randy Calkins, P.S. Designer	Jason Littler, P.S. Staff Engineer	4 Survey Crews	5 CADD Operators		
Taylor Waterline Feasibility, I.D. # 309*	P					X							X											P
Poplar Ridge Waterline Feasibility, I.D. # 298*	P					X							X											P
Summit Park Waterline Feasibility I.D. # 288*	P					X							X											P
Fairmont (Hendrickson) Subsidence*	P			X		X					X	X				X			P	P	P			
Tunnelton (Dillsworth) Landslide*	P			X		X					X	X			X		P		P	P	P			
Arlington (Cox) Drainage*	P			X	X	X					X		X			X			P	P	P			
Sauls Run Strip and Landslide*	P		X			X					X		X			X	X	P	P	P	P			
Hodgesville Waterline Feasibility I.D. # 275*	P					X							X											P
McElwain Waterline Feasibility I.D. # 271*	P					X							X											P
Old Bridgeport Hill Mine Drainage, Ph II*	P		X	X	X	X					X	X		X	X	X	X			P	P	P		
Flint Run East Acid Mine Drainage**	P		X			X					X	X		X	X	X	X					P	P	
Murray City AMD and Art Project***	P			X	X	X					X	X		X									P	P
Danehart Acid Mine Drainage**	P		X			X					X	X		X			X						P	P
Nutters Tipple Bond Forfeiture**	P		X			X					X	X			X	X	X						P	P
Lake Milton Acid Mine Drainage*	P		X			X					X	X		X	X	X							P	P

* List whether project experience is corporate or personnel based or both.
 ** Use this area to provide specific sections or pages if needed for reference.
 *** List Primary Design personnel and their functional capacity for the projects listed.

Attachment "C"

**Appendix C -
Key Personnel Qualifications & Resumes**

Greg S. Linder

Principal



32 YEARS EXPERIENCE

EDUCATION

B.S., Biology, Fairmont State College, 1993

B.S., Civil Engineering, West Virginia University,
1998

REGISTRATIONS

Professional Engineer

- WV 15629
- PA 74078

Mr. Linder's project experience has included the design, inspection, evaluation, and rehabilitation of highway and railroad bridges; secondary responsibilities have included all aspects of roadway design, hydrologic and hydraulic analyses, civil/site engineering, and permitting.

Mr. Linder has been involved with the engineering design and/or inspection of numerous bridges, including highway, railway, and pedestrian bridges. He has designed bridge structures for large, governmental clients, as well as smaller governmental units and private sector organizations. Several of these projects have been "high profile" projects, allowing Mr. Linder the experience of working under intense public scrutiny. In addition to bridge design, Mr. Linder has been involved with roadway design, floodplain evaluation projects, streambank protection projects, site development projects, and environmental projects.

PROJECT EXPERIENCE

Transportation

U.S. Route 35, Mason County, WV*

Project Manager responsible for oversight, design, and plan preparation for the 1.85 mile section of four-lane divided highway. The section of highway also includes dual 414.5' bridges over Three Mile Creek and dual 106.75' bridges over Two Mile Creek. In addition, the project includes 0.62 miles of side road relocation, a reinforced concrete box culvert carrying an access road over Twomile Creek, waterline relocation plans, and natural stream design.

Appalachian Corridor H, Davis to Bismark, Tucker and Grant Counties, WV*

Project Manager responsible for oversight, design, and plan preparation for the 1.61 mile section of four-lane divided highway near Davis, WV.

Weatherford Industrial Access Road, Upshur County, WV*

Project Manager responsible for oversight, design, and plan preparation for the 0.56 mile industrial access road in Buckhannon, WV.

King Coal Highway, Mingo County, WV

Staff Engineer responsible for designing the roadway and drainage system for a 3.2-mile section of the 96-mile, four-lane divided highway.

Coalfields Expressway, Pound Connector Section, Wise and Dickenson Counties, VA*

Project Leader responsible for oversight, design, and plan preparation for the 16 mile section of four-lane divided highway near Pound, VA.

Enterprise/I-79 Connector, U.S. Route 19 to I-79, Environmental Assessment, Marion County, WV

Staff Engineer responsible for the coordination of environmental and engineering services associated with the preparation of the NEPA document. Environmental services included data collection, field reconnaissance, and assessment of the environmental features encountered within the project area. The environmental features were delineated using 200:1 scale mapping.

Engineering services included the development and evaluation of three alternative alignments that were approximately three miles



Greg S. Linder

Principal

long using environmental features mapping and current WVDOH design criteria. The typical section included two 12-foot lanes and two 8-foot shoulders. Plans, profiles, and preliminary construction cost estimates were prepared for each alternative alignment. The environmental assessment will contain discussion of the impacts associated with each alternative and will identify the preferred alternative.

Southern Beltway, Allegheny and Washington Counties, PA

Staff Engineer responsible for performing Short-Eared Owl observations as part of the mitigation for the transportation project

Enterprise/I-79 Connector, U.S. Route 19 to I-79, Biological Assessment, Marion County, WV

Staff Engineer responsible for the field reconnaissance, literature review, and preparation of a biological assessment of the Indiana Bat. The biological assessment evaluated the potential impacts of the proposed two-lane highway on available summer habitat in the project study area. The United States Fish and Wildlife Service is expected to issue a Biological Opinion.

Meldahls Undercut Site, Wood County, WV

Staff Engineer responsible for providing environmental services for track rehabilitation. The existing embankment was to be removed and backfilled with engineered fill. The existing soil was sampled and tested for contaminants before disposal.

Responsibilities included reviewing laboratory analyses of soil samples taken within the railroad right-of-way, documenting the findings, and providing recommendations in report format.

C&O Flats, Staunton, VA

Staff Engineer responsible for providing environmental services for propane tank and railroad cross tie removal. Performed a site visit to verify that two propane tanks and a large stack of cross ties were located on CSXT property. Prepared a brief letter report discussing findings and provided recommendations for removal. Coordinated the removal with contractors and provided inspection to verify that the removal was in compliance with CSXT safety requirements.

Nelsonville Bat Survey, Athens County, OH

Staff Engineer performing the field reconnaissance for possible Indiana bat hibernaculums within the alignment of the proposed four-lane expansion of U.S. Route 33.

Structural-Bridge

US Route 35, Mason County, WV*

Project manager responsible for oversight, design, and plan preparation for structures carrying US Route 35 over Threemile Creek and Twomile Creek near Point Pleasant, WV. The Threemile Creek bridge consists 414.5' dual plate girder structures that are both 44.5' wide. The bridge substructure consists of integral abutments and cap and column piers supported on pile foundations. . The Twomile Creek bridge consists 106.75' dual plate girder structures that are both 44.5' wide. The bridge substructure consists of integral abutments.

Mile Branch Truss Bridge, McDowell County, WV

Project manager responsible for oversight, design, and plan preparation for the 180-foot, 22-foot wide steel bridge crossing the Dry Fork River. The bridge substructure consists of integral abutments and T-Type piers supported on caisson foundations. The project also involved 370' of new two-lane roadway design.

Upper Tract Bridge, Pocahontas County, WV

Project manager responsible for oversight, design, and plan preparation for the 346-foot long, 30-foot wide curved steel bridge crossing the South Branch of the Potomac River. The bridge substructure consists of integral abutments and T-Type piers supported on caisson foundations. The project also involved 740' of new two-lane roadway design.

SR4027 over Bentley Creek, Bradford County, PA*

Project manager responsible for oversight, design, and plan preparation for the design build project. The project consisted of superstructure replacement of the 159-foot, continuous P/S adjacent box beam bridge crossing Bentley Creek. The project also involved 412' of new two-lane roadway design.

Greg S. Linder

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SR4033 over Brady Run, Beaver County, PA*

Project manager responsible for oversight, design, and plan preparation for the design build project. The project consisted of replacement of the 45-foot, P/S spread box beam bridge crossing Brady Run. The bridge substructure consists of full height abutments supported on driven piles. The project also involved 267' of new two-lane roadway design.

SR388 over Big Run, Lawrence County, PA*

Project manager responsible for oversight, design, and plan preparation for the design build project. The project consisted of replacement of the 77-foot, P/S spread box beam bridge crossing Big Run. The bridge substructure consists of integral abutments. The project also involved 288' of new two-lane roadway design.

SR1037 over Trump Run, Fayette County, PA*

Project manager responsible for oversight, design, and plan preparation for the design build project. The project consists of replacement of the 103-foot, P/S bulb-tee beam bridge crossing Trump Run. The bridge substructure consists of integral abutments. The project also involves 310' of new two-lane roadway design.

SR2003 over Jacobs Creek, Westmoreland County, PA*

Project manager responsible for oversight, design, and plan preparation for the design build project. The project consists of replacement of the 90-foot, P/S spread box beam bridge crossing Jacobs Creek. The bridge substructure consists of integral abutments. The project also involves 356' of new two-lane roadway design.

SR249 over Losey Creek, Tioga County, PA*

Project manager responsible for oversight, design, and plan preparation for the design build project. The project consists of replacement of the 53-foot, P/S spread box beam bridge crossing Losey Creek. The bridge substructure consists of spread footings supported on soil.

Mon/Fayette Expressway, S.R. 0043, Section 52G, Washington County, PA

Staff Engineer responsible for final design for dual, nine-span continuous, steel multi-girder bridges with overall lengths of 2,300 feet and 2,500 feet respectively, having maximum spans of 300 feet. Pier-substructure units are single-shaft, cast-in-place concrete with a maximum height of 230 feet. The structures span Mingo Creek, Froman Creek, S.R. 0088, and the Wheeling & Lake Erie Railroad.

Allegheny County Bridge Inspection Program, Allegheny County, PA

Staff Engineer responsible for conducting National Bridge Inspection Standards (NBIS) inspections and load ratings for approximately 20 bridges comprised of a variety of structural forms and materials, including steel, concrete, and wooden elements. Regional Transit Authority* Inspection Team Leader responsible for the in-depth inspection of three railroad bridges and three culverts. Two of the bridges were twin, rolled-beam structures; and the other bridge was a twin, built-up girder structure. Two of the culverts consisted of 96" corrugated metal pipes and the other culvert was a 371' twin box culvert.

S.R. 0056 over Stony Creek, Cambria County, PA

Staff Engineer responsible for redesign of the superstructure replacement for a 406', four-span steel girder bridge. Responsibilities included design of a horizontally curved steel superstructure using finite element analysis. Tasks included the design of primary and secondary steel members and redesign of the deck. The design consisted of four simple spans to prevent increasing the forces in the existing substructure.

S.R. 0309 over Church Road, Montgomery County, PA

Staff Engineer responsible for final design for the structure rehabilitation. The rehabilitation of the sharply skewed welded steel structure involved the replacement of the deck, primary and secondary superstructure elements, and the bearings.

Star City Bridge (WV Route 7) Over the Monongahela River, Monongalia County, WV*

Assistant Investigator responsible for preparing a confidential report outlining the conditions that led to a visibly out-of-plane distortion in the steel girder system at the completion of erection.

Greg S. Linder

Principal

S.R. 0022 over Stony Run, Pennsylvania Department of Transportation, District 12-0, Westmoreland County, PA
Staff Engineer responsible for the preliminary alternative design, Type Size, and Location preparation, and cost estimate preparation for the replacement of S.R. 0022 over Stony Run.

Bridge Design Group H, Allegheny County, PA

Staff Engineer responsible for the replacement of Girty's Run Bridge No. 16 (GI16), Thompson Run Bridge No. 2 (TN02), Thompson Run Bridge No. 3 (TN03), and Thompson Run Bridge No. 4 (TN04). Responsibilities included structural inspection, evaluation, and preparation of the inspection report for each bridge. Type, Size, and Location Reports were also prepared for each bridge.

PA Route 28, Galleria Mall Interchange, Allegheny County, PA*

Staff Engineer responsible for preliminary and final design of a 274' chorded prestressed I-beam bridge as part of the new interchange on S.R. 28 (also known as the Allegheny Valley Expressway). The superstructure consists of 96" deep I-beams. The interchange serves a privately developed regional mall along a rural portion of the highway approximately 1.1 miles northeast of the Harwick Interchange. The project was fast-tracked for the developer with coordination with PENNDOT.

Replacement of Scotia Hollow Bridge No. 1 (XC01) and Licks Run Bridge No. 9 (LC09) and the rehabilitation or replacement of Catfish Run Bridge No. 3 (CT03), Allegheny County, PA

Project Engineer. The project included structural inspection for each bridge and preparation of the inspection reports. After evaluation, it was determined XC01 and LC09 would need replaced. CT03 would need rehabilitated. Plans and construction sequences for emergency repairs were developed for XC01 and LC09. Subsequent to the structural inspection and emergency repairs, preliminary design was performed for the replacement of XC01 and LC09, and the rehabilitation of CT03. Responsibilities included the preparation of Erosion and Sediment Control Plans, and Hydrologic and Hydraulic Reports for each structure, and preliminary design.

NJ Route 18 Extension, Section 2F, New Brunswick, NJ*

Project Engineer responsible for Quality Assurance/Quality Control for the final design calculations for two pedestrian bridges. The first bridge is the Carpenter Road Pedestrian Bridge over NJ Route 18. The bridge is a 156' prefabricated truss structure. Responsibilities included reviewing the substructure and foundation design calculations. The second bridge is the Richmond Street Pedestrian Bridge over NJ Route 18. The bridge is a 200' prefabricated truss structure with 145' elevated approach ramps. The approach ramps consist of prestressed concrete plank beam structures. Responsibilities included reviewing the substructure and foundation design calculations for the main span and reviewing the superstructure and substructure design calculations for the approach spans.

North Shore Connector, Aerial Structure, Allegheny County, PA*

Project Engineer responsible for final design of a 16-span light-rail elevated structure. The structure will connect Pittsburgh's light rail system to the North Shore area of the city, including Heinz Field and PNC Park. The superstructure design consists of finite element analysis of curved steel box girders.

S.R. 836 Extension From NW 107th Avenue to NW 137th Avenue, Miami-Dade County, FL

Project Engineer for the S.R. 836 Extension design/build project, which consists of a new four-lane facility extending westward from the Homestead Extension of the Florida Turnpike (HEFT) to NW 137th Avenue and improvements to the existing S.R. 836 main line and ramps to the east of the S.R. 836/NW 107th Avenue interchange. The project includes the construction of new and reconstructed roadways, ten new bridges, retaining walls, and noise abatement walls. Responsibilities included preliminary design for Bridge No. 2 and Bridge No. 3. Bridge No. 2 is a 724.5' curved steel box girder structure. Bridge No. 3 is a 645' curved steel box girder structure. Tasks included design of the primary and secondary superstructure elements and providing steel quantities to the contractor for the bid package.

Rail Rehabilitation Project, Akron and Canton, OH

Inspection Team Leader responsible for the in-depth inspection of three railroad bridges and three culverts. Two of the bridges were twin, rolled-beam structures; and the other bridge was a twin, built-up girder structure. Two of the culverts consisted of 96" corrugated metal pipes and the other culvert was a 371' twin box culvert.

Stream Restoration and Streambank Protection



Greg S. Linder

Principal

Laurel Lake Sediment Removal Project, Mingo County, WV

Project Manager responsible for oversight, design, and plan preparation for the sediment removal project. The project involves the removal of seven (7) feet of sediment in the upper portion of the lake to restore recreational benefit. The project also includes the design of a 0.25 mile access road along the lake and 0.5 miles of natural stream restoration to Laurel Creek upstream of the lake.

Parchment Valley Streambank Protection, Jackson County, WV

Project Manager responsible for oversight, design, and plan preparation for a streambank protection project near Ripley, WV. The project involved geotechnical investigation and riprap revetment design.

Berger Slope Failure, Brooke County, WV

Project Manager responsible for oversight, design, and plan preparation for a streambank stabilization on Harmon Creek near Weirton. The project involved geotechnical investigation and a gabion wall design. The project was an emergency project since the streambank failure endangered the stability of a local residence along Harmon Creek.

Fisher Landslide Stabilization, Jackson County, WV

Project Manager responsible for oversight, design, and plan preparation for a soldier pile retaining wall to stabilize a streambank failure on Mill Creek. The project was an emergency project since the streambank failure endangered the stability of a furniture store.

Cairo Streambank Protection, Ritchie County, WV

Project Manager responsible for oversight, design, and plan preparation for a streambank protection project in Cairo, WV. The project involved structure stabilization to a commercial business and a riprap revetment design.

Barkers Creek Streambank Protection, Wyoming County, WV

Project Manager responsible for oversight, design, and plan preparation for a streambank protection project in Bud, WV. The project involved structure stabilization to a local residence and a riprap revetment design.

Retail

Texas Roadhouse, Wood County, WV

Project Manager responsible for oversight, design, and plan preparation for the site development of a proposed Texas Roadhouse and other commercial development in Parkersburg, WV. Services include parking layout, drainage design, traffic studies, and curb layout.

CGP Development, Barbour County, WV

Project Manager responsible for oversight of the project team that designed and produced the site grading plan, paving plan, stormwater management and erosion & sediment control plans for this 5-acre commercial development site in Philippi, WV. Proposed businesses are Shop-n-Save and Dollar General. The project also involved a hydrologic and hydraulic evaluation of Anglins Run to determine impact on the base flood elevation due to the proposed construction and a bridge over Anglins Run.

CGP Development, Grant County, WV

Project Manager responsible for oversight of the project team that designed and produced the site grading plan, paving plan, stormwater management and erosion & sediment control plans for this commercial development site in Petersburg, WV. Proposed businesses are Shop-n-Save and Dollar General.

CGP Development, Ritchie County, WV

Project Manager responsible for oversight of the project team that designed and produced the site grading plan, paving plan, stormwater management and erosion & sediment control plans for this commercial development site in Harrisville, WV. Proposed businesses are Shop-n-Save and Dollar General.

CGP Development, Upshur County, WV

Project Manager responsible for oversight of the project team that designed and produced the site grading plan, paving plan, stormwater management and erosion & sediment control plans for this commercial development site in Buckhannon, WV. Proposed businesses are Dollar General.

Greg S. Linder

Principal

CGP Development, Lewis County, WV

, , WV* Project Manager responsible for oversight of the project team that designed and produced the site grading plan, paving plan, stormwater management and erosion & sediment control plans for this commercial development site in Jane Lew, WV. Proposed businesses are Dollar General.

Power

Greenland Gap Wind Project, Grant County, WV

Project Manager responsible for oversight, design, and plan preparation for the civil engineering design for a 142 turbine wind power project. The project includes 22 miles of access road design, drainage system design, and an erosion and sediment control plan. In addition, the project included the relocation of Grassy Ridge Road (Grant County Route 42/1).

Bluestone River Wind Power Project, Tazewell County, VA

Project Manager responsible for oversight, design, and plan preparation supporting a local transportation study for a proposed 82.5 MW Wind Power Project. The Project consists of 33 2.5 MW wind turbines, approximately 15 miles of access roads, 20 miles of underground interconnection cables, a 3-acre project substation, a 2-mile transmission line to the point of interconnection at the AEP Lonesome Pine substation, as well as a 3-acre operations and maintenance facility, a temporary 3-acre concrete batch plant and 2-3 permanent meteorological towers.

Trans-Allegheny Interstate Line (TRAIL-CO), Northern West Virginia*

Project Manager responsible for oversight of the design and preparation of nearly 140 Driveway Encroachment Permits for access roads onto West Virginia Division of Highways Right of Way to support the construction of the major transmission line. In addition, Mr. Linder was responsible for the oversight, design, and plan preparation of approximately five miles of access roads.

Municipal

Deegan Lake Dam Rehabilitation and Hinkle Lake Dam Breach, Environmental Assessment, Bridgeport, WV

Staff Engineer providing environmental services for the completion of the environmental clearance for the rehabilitation of Deegan Lake Dam and the breaching of Hinkle Lake Dam.

Mining

ICG/Arch Coal Sentinel Mine, Philippi, WV

Project manager responsible for oversight, design, and plan preparation for structure modifications at the Sentinel Mine. The project consisted of: column and beam strengthening of a building to increase hoist capacity from 10 to 15 tons; repairing/strengthening columns on the refuse bin and installing reinforced concrete barriers to guide trucks through the loadout without impacting the support columns; installing new cables on the wash thickener to re-plumb the drive unit.

ICG/Arch Coal Tygart Mine, Grafton, WV

Project manager responsible for oversight, design, and plan preparation for new structures at the Tygart Mine. The project consisted of: design of 400 linear feet of tunnel extension; design of a stacked tubes; and design of a radial stacker pad.

ICG/Arch Coal Wolf Run and Bismark Mines, Sago and Bismark, WV

Project manager responsible for oversight, design, and plan preparation for the structural design of a beltline extension at the Bismark Mine. The project consisted of: structural inspection of the beltline tube at Wolf Run prior to relocation to Bismark; tower and foundation design at the Bismark Mine; floor slab and foundation design for the drive assembly.

Laurel Mountain Wind Farm Operation and Maintenance Building, Elkins, WV

Project manager responsible for oversight, design, and plan preparation for the structural design of a beltline extension at the Bismark Mine. The project consisted of: structural inspection of the beltline tube at Wolf Run prior to relocation to Bismark; tower and foundation design at the Bismark Mine; floor slab and foundation design for the drive assembly.

Gladly Fork Alkaline Mine Drainage Treatment Plant, Buckhannon, WV

Project manager responsible for oversight, design, and plan preparation for the reinforced concrete of the following elements at the Gladly Fork plant: aeration basin tank, flocculator tanks, control building floor slab, settling basin tanks, sludge thickener tank, and geotube slab.

Greg S. Linder

Principal

Hampton AML Site, Boone County, WV

Structural Engineer responsible for the bridge inspection, rating, and strengthening of an existing bridge located on the road accessing the reclamation site.

Permit D-35-82, Glady Fork Mining Inc., Upshur County, WV

Project Manager responsible for oversight, design, and plan preparation for the design of an acid mine drainage treatment facility. The project involves the civil, structural, process, mechanical, and electrical engineering design of a remotely operated 2,000 gallon per minute treatment facility. The facility includes intake boreholes, flow control, mechanical aeration basins, variable speed flocculators, chemical injection buildings, settling basins, sludge thickeners, and sludge removal equipment. The project also includes design of two access roads with a bridge over the Right Fork of Stonecoal Creek.

Manufacturing/Industrial/Warehouse

Jacksons Mill Livestock Arena, Lewis County, WV

Project Manager responsible for oversight of the project team that prepared the site grading plan and architectural plans for a livestock arena at Jackson's Mill. The project also involved a fire suppression and alarm system and construction management.

Hospitality & Recreation

Holiday Inn Express, Lewis County, WV

Project Manager responsible for oversight of the project team that designed and produced the site grading plan, paving plan, stormwater management and erosion & sediment control plans for this commercial development site in Weston, WV. Proposed businesses are Holiday Inn Express.

Microtel, Upshur County, WV

Project Manager responsible for oversight of the project team that designed and produced the site grading plan, paving plan, stormwater management and erosion & sediment control plans for this commercial development site in Buckhannon, WV. Proposed businesses are Microtel.

Floodplain Management

Spencer Hydraulic Study, Roane County, WV

Project Manager responsible for oversight, design, and plan preparation for a floodplain improvement project in Spencer, WV. The project involves performing a hydraulic study to verify the benefit of constructing a bankfull bench for flood storage and developing construction plans and specifications for the bench.

Coalwood Floodplain Improvement, McDowell County, WV

Project Manager responsible for oversight, design, and plan preparation for a floodplain improvement project in Coalwood, WV. The project involves floodplain excavation between the bankfull elevation and the toe of slope to improve storage capacity in the floodplain, thereby reducing property damage resulting from flood events.

Back Creek Floodplain Evaluation, Berkeley County, WV

Project Manager responsible for oversight on the Hydrologic and Hydraulic Investigation of Back Creek to determine impacts to the base flood elevation as a result of the proposed stream restoration.

Charles Rhodes Floodplain Investigation, Tucker County, WV

Project Manager responsible for oversight on the Hydrologic and Hydraulic Investigation of Shavers Fork to determine impacts to the base flood elevation as a result of the proposed residential construction.

Carol Thomas Floodplain Evaluation, Tucker County, WV

Project Manager responsible for oversight on the Hydrologic and Hydraulic Investigation of Shavers Fork to determine impacts to the base flood elevation as a result of the proposed residential construction.

Rachel Floodplain Improvement, Marion County, WV

Project Manager responsible for oversight, design, and plan preparation for a floodplain improvement project in Rachel, WV. The project involves floodplain excavation between the bankfull elevation and the toe of slope to improve storage capacity in the floodplain, thereby reducing property damage resulting from flood events.

Greg S. Linder

Principal

Krout Creek H&H Investigation, Wayne County, WV

Project Manager responsible for oversight for the hydrologic and hydraulic investigation to identify sources of flooding problems in the community of Spring Valley, WV. The study was performed in cooperation with the Army CORPS of Engineers to augment Phase II of their study. In addition, construction documents were developed for the floodplain excavation project.

Parsons First Baptist Church H&H Study, Tucker County, WV

Project Manager responsible for oversight on the Hydrologic and Hydraulic Investigation of Shavers Fork to determine impacts to the base flood elevation as a result of the proposed expansion project.

Martin Oil Company H&H Study, Lewis County, WV

Project Manager responsible for oversight on the Hydrologic and Hydraulic Investigation of a tributary of Hackers Creek to determine impacts to the base flood elevation as a result of the proposed site development. The project involved the construction of approximately five feet of embankment within the 100-year floodway.

Freemans Creek H&H Study, Lewis County, WV

Project Manager responsible for oversight on the Hydrologic and Hydraulic Investigation of Freemans Creek which is a tributary of the West Fork River to determine impacts to the base flood elevation as a result of the construction of a proposed Livestock Arena at Jackson's Mill. The project involved the construction of approximately four feet of embankment within the 100-year floodway to elevate the structure one foot above the base flood elevation.

North Fork Watershed Management Plan, Pendleton and Grant Counties, WV

Staff Engineer responsible for various tasks associated with the watershed management plan such as the review of water resources, forest management, wetland documentation, sedimentation and erosion control, and flood prevention.

Academic & Institutional

Talcott Elementary School, Talcott, WV

Responsible for oversight of the project team for the design and development of the site (including above- and below ground utilities, pedestrian walkways, access roads, fill slopes, lighting and signage, and landscaping design) and all site-related construction documents (specifications, drawings, NPDES permit) for the new Talcott Elementary School.

Buckhannon-Upshur High School Site Improvement and Drainage Project, Buckhannon, WV

Responsible for oversight of the project team that designed improvements to the existing football facility, including the installation of a multi-purpose synthetic turf at the football field and a stormwater detention / storage system underneath the football field. The project team responsibilities included the design and development of the contract specifications and drawings, the preparation of the NPDES permit, and the coordination of efforts between all parties involved due to the "fast-track" requirements of this project (design to construction to completion in three (3) months).

** Work performed prior to joining CEC*

TRAINING

West Virginia Division of Highways Natural Stream Design Levels I, II, III, IV

Kow O. Eshun, P.E.

Senior Project Manager



15 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering, Kwame Nkrumah
University of Science and Technology, 2005

M.S., Geotechnical Engineering, The University
of Akron, 2013

Mr. Eshun has 15 years of diverse experience in Geotechnical engineering, Logistics, Transportation and Construction Quality Assurance. Mr. Eshun has worked on a wide range of subsurface investigations to provide recommendations for shallow foundations, intermediate foundations, deep foundations, retaining structures, slope stability analyses, ground improvement techniques, mine subsidence, and earthwork for both greenfield and brownfield projects. Experience also includes geohazard characterization for pipeline projects, landslide mitigation and landslide remediation.

Additionally, Mr. Eshun has managed a wide range of projects in the transportation, health, natural gas, manufacturing, telecom and utilities industries including roadway projects, well pads, compressor stations, building projects, substation construction and expansion.

PROJECT EXPERIENCE

Transportation/Aviation

Charleston Interstate Roadway Lighting Renovation, WVDOH, Charleston Kanawha, WV*

Overall project manager for the geotechnical exploration and design of foundations for the high mast lighting poles for the I-64 in Charleston. Kow managed a 4-week drilling schedule on a busy interstate road working night shift to minimize the interruption to traffic. Project involved the design of over 25 drilled caissons. Managed and coordinated the structural design of the caissons with our subcontractor (Michael Baker Jr., Inc.)

Mingo County Regional Airport, Chapman Technical Group, Williamson Mingo, WV*

The project involved the construction of airport on a post mine land. Mr. Eshun coordinated and managed the soil improvement aspect of the site for the hangar and fuel farm. The improvement technique for the project was deep dynamic compaction. Managed field work and also the post improvement testing for the site.

Upshur County Regional Airport, Chapman Technical Group, Buckhannon Upshur, WV

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses. Prepared both preliminary and final recommendations for earthwork, pavement design for the rehabilitation of the apron and taxiway.

Tabler Station Connector Roadway, WVDOH, Martinsburg Berkeley, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses for the proposed roadway. Prepared both preliminary and final recommendations for earthwork, construction, karst treatment and cut/fill slope stability and construction for the proposed roadway

REGISTRATIONS

Professional Engineer

- TX
- KY
- MD
- WV
- PA
- VA
- OH

CERTIFICATIONS

Project Management Professional
(PMP), Project Management Institute

10-Hour OSHA Construction Safety
(Occupational Safety & Health
Administration), OSHA



Kow O. Eshun, P.E.

Senior Project Manager

East Burke Bridge Replacement, WVDOH, Martinsburg Berkeley, WV*

Served as staff engineer for this project which consisted of the replacement of the existing bridge. He managed subsurface exploration, laboratory testing and was involved with the preparation of recommendations for the foundation of the bridge abutments

WVDOH Thomas Buford Pugh Bridge, Orders Construction Company, Prince Fayette, WV*

Project involved the replacement of the existing bridge with a new one. Managed the drilling and laboratory testing services for the preinstallation borings. Information from the borings was used to provide design recommendations for the caissons for the foundations

Meathouse Fork Bridge, Thrasher Engineering, New Milton Doddridge County, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses. Prepared both preliminary and final recommendations concerning earthwork and the design and construction of foundations for the proposed bridge

Shipping and Logistics

Maersk Line Vessel Operations, AP Moller Maersk, Cape Town South Africa*

Maersk Line is the global container division and the largest operating unit of the A.P. Moller Maersk Group, a Danish business conglomerate. It is world's second largest container shipping company having customers through 374 offices in 116 countries. It employs approximately 7,000 sea farers and approximately 25,000 land-based people. Maersk Line operates over 600 vessels and has a capacity of 2.6 million TEU. Mr. Eshun was part of the team that migrated Africa vessel operations from the global operation center in London to Cape Town, South Africa. Kow also managed the development of cost cutting measures and documentation of standard operation procedures for a variety of operations.

Real Estate

Taco Bell Site 310603, Huntington Cabell, WV*

Managed and coordinated the subsurface exploration, laboratory testing, geotechnical analyses and environmental screening. Prepared both preliminary and final recommendations for earthwork, ground improvement options and foundation design recommendations for the construction of the new Taco Bell

Reserve at Rosebud, Miller-Valentine Group, Clarksburg Harrison, WV

Managed Construction Quality Assurance (CQA) aspect of the project which consisted of construction of a residential block of flats. Services provided to contractor included testing of concrete, earthwork monitoring and testing, and general construction observations.

Power

AEP Nuttall Substation, American Electric Power, WV*

Project Manager for the geotechnical exploration and providing recommendations for earthwork, seismic consideration and foundations design and construction for the new substation. Evaluated the risks associated with developing the site that was previously deep mined. The project included developing methods to reduce the risks associated with construction over the abandoned deep mine workings and associated cost estimates Exploration also included Electrical Earth Resistivity (EER) testing for the grid design.

AEP Mollys Creek Substation, American Electric Power, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses. Prepared both preliminary and final recommendations for earthwork, foundation design (both shallow and deep foundations) and slope stability for the proposed new substation. Evaluated the risks associated with developing the site that was previously deep mined. The project included developing methods to reduce the risks associated with construction over the abandoned deep mine workings and associated cost estimates.

AEP Bradley Substation, American Electric Power, Bradley Rayleigh, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses for the proposed expansion of the existing substation. Prepared both preliminary and final recommendations for earthwork, foundation design (both shallow and deep foundations)

Kow O. Eshun, P.E.

Senior Project Manager

AEP Amos-Chemical 138 kV Rebuild, American Electric Power, WV*

Managed the geotechnical site exploration for the construction of transmission lines linking two stations. The project consists of using deep foundation (drilled caissons) to support the proposed towers

AEP Union Carbide Station 8, American Electric Power, Institute Kanawha, WV*

Managed the expansion of an existing electric substation at the plant. Managed and coordinated the Electrical Earth Resistivity testing for the ground grid design of the proposed expansion

AEP Proposed Backup Generator Foundation, American Electric Power, Radford Pulaski, VA*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses. Prepared recommendations for earthwork, foundation design (shallow foundation) for a generator pad

Beech Ridge Battery Storage, Invenergy, LLC, Rupert Greenbrier County, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses. Site was filled with mine spoils and deep dynamic compaction option was recommended to improve soil. Managed and supervised the DDC and post testing work to permit the use of shallow foundations to support the proposed structure.

AEP Elk Creek Tap 46 kV, American Electric Power, Verner Logan, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses for the proposed expansion of the substation. Provided geotechnical recommendations for design and construction of deep foundations to support proposed structures

AEP Amos-Turner 138 kV Line Project, American Electric Power, Institute Kanawha, WV*

Managed the geotechnical site exploration and laboratory testing for the construction of new transmission lines. The project consists of using deep foundation (drilled caissons) to support the proposed towers

AEP Turner -Chemical 138 kV Line Project, American Electric Power, Institute Kanawha, WV*

Managed the geotechnical site exploration and laboratory testing for the construction of new transmission lines. Provided design and construction recommendations for deep foundations for support of the proposed towers

AEP Jackson Ferry Wythe 138 kV Line Project, American Electric Power, Wytheville Wythe, VA

Kow was the staff engineer responsible for the management of the field exploration and testing for the transmission line project. He was also involved with the preparation of the geotechnical report detailing recommendations for treating of karst conditions, design and construction of deep foundations for the proposed transmission towers.

Oil & Gas

CNX Morris Tank Pad, CNX Gas Company, WV*

Served as staff engineer on this project which involves the management of the field exploration and testing services for a proposed water tank and access road. Project consisted of drilling and sampling 11 borings. Kow used the information from the exploration to develop geotechnical recommendations for site preparation, embankment construction, roadway construction, slope stability and foundations design

CNX Frye Tank Pad, CNX Gas Company, WV*

Served as staff engineer on this project which involves the management of the field exploration and testing services for a proposed water tank and access roads. Project consisted of drilling and sampling 29 borings. Information from the exploration was used to develop geotechnical recommendations for site preparation, embankment construction, roadway construction, slope stability and foundations

CNX OXFD 14 Well and Tank Pad, Doddridge County, WV

Served as staff engineer on this project which involves the management of the field exploration and testing services for a proposed water tank and access roads. Project consisted of drilling and sampling 24 borings. Information from the exploration was utilized to develop geotechnical recommendations for site preparation, embankment construction, roadway construction, slope stability and foundations

Kow O. Eshun, P.E.

Senior Project Manager

CNX Miller AST Pad, CNX Gas Company, WV*

Served as staff engineer on this project which involves the management of the field exploration and testing services for a proposed water tank and access roads. Information from the exploration was utilized to develop geotechnical recommendations for site preparation, embankment construction, roadway construction, slope stability and foundations for the AST

CENT 22 AST, WV

Managed the project the field exploration and testing services for a proposed water tank and access roads. Information from the exploration was utilized to develop geotechnical recommendations for site preparation, earthwork and the design and construction of foundations and slabs for the AST

Goodwin Well Pad, WV

Served as staff engineer on this project which involves the management of the field exploration and testing services for a proposed water tank and access roads. Project consisted of drilling and sampling 25 borings. Information from the exploration was used to develop geotechnical recommendations for site preparation, embankment construction, roadway construction, slope stability and support of proposed well pad

Moore to Revival Pipeline Slip, Antero Resources, Salem Doddridge, WV

Managed the investigation and remedial design of a landslide along a pipeline right of way in Doddridge County, WV. CEC was retained by gas company to develop an approach to stabilize the landslide because it was threatening the integrity of the pipeline. CEC developed an approach to regrade the slope, provide adequate drainage, and construct a toe key to stabilize the slope.

Varner Well Pad Slip, Antero Resources, Salem Doddridge, WV

Managed the investigation and remediation of a landslide at a well site in Doddridge County, West Virginia. CEC was retained by an oil & gas company to investigate a landslide that had the potential to slide down into existing ponds downslope of a gas well pad. The landslide was occurring along the slope of an active well pad. CEC investigated the landslide and developed an approach to regrade the slope to stabilize the landslide. CEC provided drawings and specifications for the work. CEC is in the process of providing oversight for the slip repair.

Slope Monitoring and Landslide Remediation, Nisource, Southern West Virginia, WV*

Project Engineer for the investigation, monitoring and design of landslide remediation plans for various gas pipelines in southern West Virginia. The projects involved the two stages; designing landslide remediating plans and monitoring stability of slopes using a combination of piezometers and inclinometers. Managed the field investigations, modeled the slopes to develop remediation plans for failed slopes and a ranking system for the management of the risk of slope failures.

Sherwood Plant, MarkWest Energy, Sherwood Doddridge County, WV

Project involved the construction of bridges to provide access for the construction of a substation for the Sherwood Plant. Managed the geotechnical investigations and provided recommendations for the foundation design for the bridge foundations

PEN 40 Well Site, EQT, Pennsboro Ritchie, WV

Managed the geotechnical investigations at the proposed well site and prepared report providing recommendations for site earthwork, cut and fill recommendations and slope stability.

FAW 55, EQT, Monongah Marion, WV

Provide geotechnical engineering services relating to the county road improvement for FAW 55 well pad site. Managed the geotechnical subsurface exploration and provided design recommendations for a soldier pile and lagging along access road to the site.

Nixon Compressor Station, CNX Gas Company, LLC, Lost Creek Lewis, WV

The project involved the construction of a compressor station on an existing farmland. Mr. Eshun planned, initiated, and coordinated the geotechnical investigations for the proposed site and provided earthwork, slope stability, and foundation recommendations for the proposed structures at the site.

Kow O. Eshun, P.E.

Senior Project Manager

Tonys Bridge Well Pad, Mountaineer Keystone, LLC, Mt Clare Harrison, WV

Managed the geotechnical investigations at the proposed well site and prepared report providing recommendations for site earthwork, cut and fill recommendations and slope stability. Also managed the compaction testing and construction monitoring for the project.

FAW 70, EQT, Monongah Marion, WV

Managed the geotechnical investigations at the proposed well site and prepared report providing recommendations for site earthwork, cut and fill recommendations and slope stability. The project involved building over an abandoned coal mine with overburden of less than 60 feet. Perform subsidence evaluation and development recommendations to reduce the risk of mine subsidence.

T. Hamilton Well Site, Mountaineer Keystone, LLC, Wexford Allegheny, PA

Managed construction material testing services for the construction of the well pad and access roads.

Gould Well Pad, XTO Energy, Warrendale Upshur, WV

Managed the geotechnical investigations and construction monitoring for the repair of a landslide affecting a portion of the well pad. Prepared a geotechnical engineering report and landslide repair drawings for construction purposes. Also provided recommendations for the disposal of soil to be excavated from the closure of an existing impoundment at the site.

Tennessee Well Pad, Antero Resources, Kincheloe Harrison, WV

Project manager for the geotechnical engineering services for the development of the well pad site. Perform subsurface investigations to develop opinions on site soil, bedrock, and groundwater and provided recommendations concerning earthwork, slope stability, and foundations.

Pool and North Fork Well Pad Sites, Antero Resources, Tollgate Ritchie, WV

Managed the geotechnical investigations at the sites for the proposed well pad and provided recommendations for site earthworks, foundations, slope stability, and construction phase services.

JB Tonkin Compressor Station, Dominion Transmission, Inc, Murrysville, PA

The project involved the expansion of an existing compressor station in PA as part of the Supply Header Project. Mr. Eshun planned, initiated, and coordinated the geotechnical and Stormwater BMP investigations for the proposed site and provided earthwork, slope stability, and foundation recommendations for the proposed structures at the site.

Mockingbird Hill Compressor Station, Dominion Transmissions, Inc., Pine Grove Wetzel County, WV

The project involved the design of a new compressor station at the site of the Mockingbird Hill Compressor Station as part of the Supply Header Project. Mr. Eshun planned, initiated, and coordinated the geotechnical investigations for the proposed site and provided earthwork, slope stability, and foundation recommendations for the proposed structures at the site. Also managed the electrical earth resistivity testing program for the site.

Supply Header Pipeline Project , Dominion Transmissions, Inc., Pine Grove Wetzel County, WV

Provided a desktop review of the soil types and bedrock along the Supply Header Pipeline alignment. The project also involved calculating a preliminary estimates of bedrock and soil quantities to be excavated during the construction of the pipeline.

Sherwood to Majorsville Pipeline ROW Slip Repairs , MarkWest Energy Partners, Littleton Doddridge, Wetzel and Marshall County, WV

Provided design for slips repairs along the pipeline ROW and managed the construction and field testing for the slips remediation. Also provided similar services for the Yankee Camp Pipeline Slip, Twenty Inches Sales Loop Pipeline Slip for MarkWest.

Trent Slip , Antero Resources, New Milton Doddridge County, WV

Managed the investigation and remedial design of a landslide along a pipeline right of way in Doddridge County, WV. Provided oversight and testing services for Antero during the construction stage of the project. Also provided similar services for Gum Run Road Slip Repairs for Antero.

Kow O. Eshun, P.E.

Senior Project Manager

Summersville City Plant , Dominion Resources Services, Summersville Nicholas County, WV

Plan and managed the geotechnical investigations for the proposed City plant in Summersville. Provided recommendations for earthwork, settlement, foundation design for the proposed project.

Manufacturing

Plant Expansion, Hino Motor Manufacturing U.S.A., Williamstown Wood, WV*

Project involved the expansion of the existing manufacturing building. Managed and coordinated the subsurface exploration and laboratory work of the project. Exploration encountered very poor/marginal soil up to about 30 feet below the ground surface. Utilized the information from the exploration and laboratory work to recommend the use of intermediate foundation system (Aggregate piers) for the foundations. The recommended option was to reduced distress to the existing foundation during construction and also provide an efficient but affordable design

Healthcare

Rite Aid, Belle Kanawha, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses. Prepared both preliminary and final recommendations for earthwork, ground improvement option and foundation design for the brownfield project

CAMC General Family Practice Building, Charleston Kanawha, WV*

Managed and coordinated the subsurface exploration, laboratory testing and geotechnical analyses. Prepared geotechnical recommendations for earthwork, foundation design (deep foundations) and construction for the proposed building extension

Electrical Upgrade Phase II, Louis A. Johnson VA Medical Center, Clarksburg Harrison, WV

The project involved the construction of an addition to an existing building at the hospital. Managed the geotechnical investigations at the site of the proposed upgrade. Prepared geotechnical engineering report providing deep foundation recommendations for the proposed addition. Also provided recommendations for site earthwork.

** Work performed prior to joining CEC*

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers

Project Management Institute

Deep Foundations Institute

PUBLICATIONS

Sett, K., Eshun, K. O., Chao, Y.-C., and Jeremi?, B., "Effect of Uncertain Spatial Variability of Soils on Nonlinear Seismic Site Response Analysis", Geotechnical Special Publication No. 225: State of the Art and Practice in Geotechnical Engineering (Proceedings of Geo-Congress 2012, Oakland, CA, March 25-29), Roman D. Hryciw, Adda Athanasopoulos-Zekkos, and Nazli Yesiller, Eds., pp.2856-2865, 2012

Alexandros Nikellis, Kow O Eshun, Mojtaba Dyanati, David A Roke, Qindan Huang, Akhilesh Chandra, Kallol Sett, "Effect of Site-Specific Soil Nonlinearities and Uncertainties on Ground Motion Intensity Measures and Structural Demand Parameters ", Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards Volume 12, Issue 4, pp.279-296, 2018

Randolph Calkins, P.S.

Senior Consultant



40 YEARS EXPERIENCE

EDUCATION

A.S. Surveying Engineering, The Pennsylvania State University

REGISTRATIONS

Professional Surveyor
• WV [REDACTED]

Mr. Calkins has 40 years of experience specializing in abandoned mine lands reclamation as both a project manager and principal designer. He has completed more than 80 abandoned mine lands projects in Ohio and West Virginia, 11 of which involved groundwater studies to determine if local aquifers had been impacted by past mining operations. Investigations involved groundwater sampling and reporting, overburden sampling, delineating the extent of past mining operations, geology and hydrology of the study area, and developing mitigation alternatives for affected residents.

Mr. Calkins is experienced in reclaiming drastically disturbed mine lands for both small and large, more-complex abandoned mine lands sites. One project included more than 300,000 cy (cy) of regrading, 15,000 linear feet (lf) of drainage conveyances and an estimated construction cost of nearly \$3 million.

Mr. Calkins has designed sixteen passive acid mine drainage treatment systems ranging from simple limestone beds to complex interactive systems that boost AMD pH to precipitate metals, settle and filter dissolved metals, and polish effluent water with alkalinity prior to release of near neutral waters from project areas. His expertise includes coal mine, 404/401, and NPDES permitting, overburden and water sampling, coal reserve studies, surveying, road construction, dam construction, and ALTA surveys. Mr. Calkins is skilled with AutoCAD, SurvCAD, Haestads, HydroCAD, HY8, and AMD Treat.

PROJECT EXPERIENCE

Norton Highwall #1, Randolph County, WV.

Project Manager on this \$2,200,000 abandoned mine lands reclamation project. The reclamation design eliminated 8,900 lf of highwall with 170,000 cy of earthwork. The project had 53 acres of clearing and grubbing and revegetation, 11,145 lf of drainage ditches, and 940 lf of installed pipes of varying sizes. The project had fifteen (15) wet mine seals, seven subsurface drains totaling 1,500 lf, and involved sediment and erosion control with an approved NPDES permit. The project involved topographical surveying to supplement project mapping, a subsurface and geological investigation with five (5) piezometers set to monitor the mine pool during initial investigations, water and soil testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Tub Run Highwall and Refuse Phase II, Tucker County, WV.

Project Manager on this \$2,800,000 abandoned mine lands reclamation project. The reclamation design eliminated 12,500 lf of highwall with 309,000 cy of earthwork. The project had 114 acres of clearing and grubbing and revegetation, 11,400 lf of drainage ditches, and 9,500 feet of constructed access road. The project had four (4) wet mine seals and involved sediment and erosion control with an approved NPDES permit. The project involved topographical surveying to supplement project mapping, a subsurface and geological investigation with one (1) piezometer set to monitor the mine pool during initial investigations, water and soil testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.



Civil & Environmental Consultants, Inc.

Randolph Calkins, P.S.

Senior Consultant

Tub Run Highwall and Refuse Phase I, Tucker County, WV.

Project Manager on this \$2,300,000 abandoned mine lands reclamation project. The reclamation design eliminated 10,000 lf of highwall with 265,000 cy of earthwork. The project had 74 acres of clearing and grubbing and revegetation, 9,900 lf of drainage ditches, four (4) pipes, an 8-foot by 8-foot box culvert installation, stream bank protection, and 8,500 feet of constructed access road. The project involved sediment and erosion control with an approved NPDES permit and ACOE permit to install the box culvert and associated stream bank protection. The project involved topographical surveying to supplement project mapping, a subsurface and geological investigation, water and soil testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Greenbrier Hollow Refuse, McDowell County, WV.

Project Manager on this \$834,000 abandoned mine lands reclamation project. The reclamation design removed a cast-over-the-hill coal refuse pile located directly behind the First Baptist Church of McDowell to a stable configuration that involved 51,000 cy of earthwork. The project included two (2) wet mine seals and 8 acres of vegetation. The project had 1,015 lf of drainage ditches, two (2) manholes, and a temporary stream crossing. The project involved extensive coordination with utility companies having lines inside the project area. The project involved treating AMD during mine dewatering and construction, and a sediment control plan and approved NPDES permit to control construction runoff. Other permits completed for the project included MM109 permits to work in the right-of-way of State roads and a USACE permit for the stream crossing. The project involved topographical surveying to supplement project mapping, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Sauls Run (Carpenter) Landslide, Lewis County, WV.

Project Manager on this \$450,000 abandoned mine lands reclamation project. The reclamation design involved mitigation of a landslide within five feet (5') of the Carpenter residence. The project involved assessing mitigation alternatives with stabilizing the slide as the preferred alternative. The project involved 40,000 cy of earthwork. The project involved 7 acres of vegetation and had 610 lf of drainage ditches, three (3) pipes, one (1) manhole, and subsurface drains to transport groundwater from the slide area. The project involved extensive coordination with utility companies having lines inside the project area. The project involved topographical surveying to develop project mapping, a subsurface investigation with eight (8) boreholes to delineate the slip plane and monitor groundwater levels. The project involved a sediment control plan, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Pageton (Lambert) Portals, McDowell County, WV.

Project Manager on this \$1,100,000 abandoned mine lands reclamation project to remove a cast-over-the-hill coal refuse pile to a stable disposal area that involved 56,500 cy of earthwork. The project included twenty three (23) wet mine seals and one (1) dry mine seal installation with drainage pipes and 24 acres of vegetation. The project had 840 lf of drainage ditches, one (1) permanent pipe, nine (9) temporary pipes, and a temporary stream crossing. The project involved extensive coordination with utility companies having lines inside the project area. The project involved treating AMD during mine dewatering and construction, and a sediment control plan and approved NPDES permit to control construction runoff. Other permits completed for the project included MM109 permits to work in the right-of-way of State roads and a USACE permit for the stream crossing, stream bank protection, and channel upgrading. The project involved topographical surveying to supplement project mapping, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Birds Creek Number Four, Preston County, WV.

Project Manager on this \$920,000 abandoned mine lands reclamation project. The reclamation design eliminated 4,300 lf of highwall with 34,600 cy of earthwork. The project included nine (9) mine seals, including four (4) wet mine seals,

Randolph Calkins, P.S.

Senior Consultant

four (4) bat gate mine seals, and one (1) dry mine seal installation with drainage pipes and 28 acres of vegetation. The project had 5,210 lf of drainage ditches, two (2) pipes, an AMD treatment plan during mine dewatering and construction, and a sediment control to control construction runoff. The project involved topographical surveying to supplement project mapping, a subsurface and geological investigation with four (4) piezometers installed to monitor mine pools during initial investigations, water and soil testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Church Creek/Manown Highwall, Preston County, WV.

Project Manager on this \$2,600,000 abandoned mine lands reclamation design to eliminate 11,800 lf of highwall with 220,600 cy of earthwork. The project included twenty six mine seals, including 21 wet mine seals, two dry mine seals, and two bat gate installations with drainage pipes and 85 acres of vegetation including 17 acres of reforestation complying with the ARRI five step process. The project had 14,882 lf of drainage ditches, one pipe, an AMD treatment plan during mine dewatering and construction, and a sediment control to control construction runoff. The project involved topographical surveying to supplement project mapping, a subsurface and geological investigation with nine piezometers to monitor mine pools during initial investigations, water and soil testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Racine (Bradshaw) Portals, Boone County, WV.

Project Manager on this \$445,000 abandoned mine lands project. Several abandoned deep mine entries are located near a group of homes along County Route 94. The reclamation design involved six non-contiguous sites requiring approximately 2,500 cy of earthwork to backfill the sites to approximate original contours and 5 acres of revegetation. Sixteen abandoned mine entryways had mine seals installed, including six wet mine seals, two dry mine seals, and eight bat gate installations with drainage pipes. Most of the abandoned mine entryways were located across Short Creek that required an Army Corps 404 permit to gain construction access. The project had 1,062 lf of drainage ditches, nine pipes, an AMD treatment plan during mine dewatering and construction, and a sediment control plan to control construction runoff. The project involved topographical surveying to supplement project mapping, soil and refuse testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Hampton Number Four Maintenance, Boone County, WV.

Project Manager on this \$970,000 abandoned mine lands project. An abandoned sidehill coal refuse fill center ditch has failed resulting in coal refuse washing into Spruce Laurel Fork, a trout fishery. The reclamation design involved filling the erosion breach (up to forty feet deep in spots) with soil borrow material and installing a six foot flat bottom ditch lined with a concrete filled fabric liner. Other project highlights include removal of petroleum contaminated soil, construction of 2,927 lf of ditches with engineered lining, grout filled fabric streambank protection, 25,000 cy of earthwork, upgrading an existing bridge to allow construction traffic, 4,180 lf of sediment control, and revegetation of 16 acres. The project involved topographical surveying to supplement project mapping, a subsurface and geological investigation, water and soil testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Howesville Sites, Preston County, WV.

Project Manager on this \$1,580,000 abandoned mine lands project. The reclamation design involved two non-contiguous sites with approximately 4,000 linear foot of highwall requiring 63,000 cy of earthwork to backfill. The reclamation design involved 5,676 lf of ditches with engineered lining, 91 lf of pipe from 12" to 24" in diameter, grouted riprap streambank protection, 11 wet mine seals, 4 wet mine seals with bat gates, AMD treatment plan during mine dewatering and construction, 17,700 linear foot of sediment control, and revegetation of 35 acres. The project involved topographical surveying of 46 acres to develop project mapping, a subsurface and geological investigation with four piezometers set to monitor mine pools during initial investigations, water and soil testing, preliminary designs, final

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designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Sandy Run Highwall and Portals, Preston County, WV.

Project Manager on this \$1,026,000 abandoned mine lands project. The reclamation design involved approximately 1,850 lf of highwall requiring 47,200 cy of earthwork to backfill. The project also included 4,148 linear foot of designed ditches with engineered lining, 258 lf of pipes ranging from 18" to 36" in diameter, a drop inlet, grouted riprap streambank protection, 6 wet mine seals, AMD treatment plan during mine dewatering and construction, 8,800 linear foot of sediment control, and revegetation of 17 acres. The project involved topographical surveying of 22 acres to develop project mapping, a subsurface and geological investigation, water and soil testing, preliminary designs, final designs, specifications, calculation brief, bid schedule, engineer's estimate of probable construction costs, pre-bid and pre-construction conferences, and monthly reports, and invoicing.

Laurel Valley (Daniels) Landslide, West Milford, Harrison County, WV.

Project Manager on this Emergency abandoned mine lands Project. Due to the emergency classification, fieldwork and generation of construction plans and specifications was on an accelerated time frame. Cast-over-the-hill mine spoil had slipped against a single family dwelling in the Laurel Valley Subdivision. The project involved removing slipped material to a stable slope configuration and placing excavated spoil against a nearby orphan highwall. The \$ 217,000 reclamation project included 13,000 cy of excavation; elimination of approximately 500 lineal feet of highwall; hydraulic and hydrologic design of 181 lineal feet of ditches, 801 lineal feet of pipes, three (3) drop inlets, and a manhole. Drainage control from the reclaimed site was problematic on this project and required collection of storm water runoff and ground water into a 615 foot long pipe that was constructed along Oak Street to the nearest existing drainage system. Construction of this piping system projected along a road through a subdivision. Other project highlights include a sediment control plan, subsurface drains, and a revegetation plan.

Weaver Highwall and Mine Drainage - Barbour & Randolph Counties, WV.

Project Manager on this \$2,500,000 abandoned mine lands Project. The project involved approximately 4,200 lf of highwall varying in height from 25 feet to 50 feet; at least 20 collapsed openings, thirteen (13) of which were discharging acid mine drainage; several scattered refuse piles and numerous subsidence features above the orphan highwall, some of which capture surface streams; scattered household trash and abandoned automobiles; and uncontrolled mine drainage that impacted down gradient residents. Historic water data estimates of acid mine drainage flowing from the seeping collapsed portals was approximately 95 gallons per minute exhibiting a pH of 3.2 with acidity concentrations around 200 mg/l, iron concentrations around 10 mg/l, aluminum concentrations around 15 mg/l, and manganese concentrations around 2 mg/l. The project involved approximately 50,000 cy of backfill, regrading, and refuse cover, approximately 4000 feet of constructed ditches in the form of open limestone ditches (an integral part of the passive treatment system), four (4) limestone pond passive acid mine drainage treatment systems, sediment control, clearing and grubbing and trash removal and revegetation of all disturbed areas. The project also involved a large subsurface investigation program to quantify mine pools within the large abandoned deep mine complex feeding the seeping collapsed portals. A total of fourteen (14) holes were drilled and four (4) piezometers were installed to monitor the mine pool during the design phase. Wetlands were delineated and a State 401 Certification and USACE Nationwide 27 Permit was obtained for the construction Project.

Sauls Run Strip and Landslide Emergency, Lewis County, WV.

Project Manager on this \$985,000 Emergency abandoned mine lands Project. Due to the emergency classification, fieldwork, and generation of construction plans and specifications was on an accelerated time frame. The project was completed from start to finish in four (4) weeks, and included field surveying to supplement existing aerial photography, design and implementation of an extensive subsurface investigation plan, and design of the project to meet WVDEP goals. The project involved three (3) slips threatening three (3) homes located in Lewis County, West Virginia. The project also involved removing and regrading approximately 50,000 cy of material to provide stable slopes behind these houses. The project also involved approximately 4,100 feet of constructed ditch, sediment control, clearing and

Randolph Calkins, P.S.

Senior Consultant

grubbing, and revegetation of all disturbed areas. The project involved a comprehensive subsurface investigation plan and analyses of existing slope stability, as well as proposed slope stability. The accompanying construction specifications allowed prospective contractors to choose from two (2) reclamation plans. One plan stated to haul all excess material off-site to a disposal area approved by the WVDEP and the other plan involved keeping all excavated materials on-site. The on-site approach required design and installation of rock underpads and rock french drains to ensure slope stability and provide free draining of placed backfill materials.

Dillsworth Landslide, Tunnelton, West Virginia.

Project Manager on this \$200,000 Emergency abandoned mine lands Project. The abandoned Kingwood Gas, Coal, and Iron Company was impacting the Dillsworth residence. A small outbuilding located behind the Dillsworth garage has collapsed due to excessive soil pressures from upgradient saturated, unstable slopes. In addition, the Dillsworth basement and garage were constantly being inundated with alkaline mine water. The project involved installation and construction of an 84-foot long by 18-foot high Gabion Basket Retaining Wall and three (3) Subsurface Drains to capture and divert uncontrolled deep mine drainage, groundwater, and surface water around the Dillsworth basement and garage.

Ohio Abandoned Mine Lands Projects, ODNR - Flint Run Acid Mine Drainage Reclamation Project, Jackson County, Ohio.

Project Manager on this \$1.3 million abandoned mine lands Reclamation Project. The Flint Run Acid East Acid Mine Drainage Reclamation Project required 44-drafted construction plan sheet (24" x 36") and Detailed Conditions and detailed Specifications. The Project hydrologically isolated a coal refuse fill area and constructed passive acid mine drainage treatment systems to add alkalinity to Project waters. The Project also involved implementation of a sediment and erosion control plan, clearing and grubbing operations and controlled release of approximately 12.8 M gallons of impounded waters within the Project area. The scope of the work will be to excavate approximately 73,091 cy of material to install and construct site drainage conveyance structures through and around the Project area. An additional 207,600 cy of materials will be moved to provide positive drainage toward constructed drainage conveyance structures and away from the coal refuse fill area. Approximately 17,381 cy of material will be moved to construct passive acid mine drainage treatment systems and approximately 42,143 cy of these materials will be required for construction of compacted embankments associated with the passive acid mine drainage treatment systems and soil lining for ditches and channels. Some encountered materials and some cleared and grubbed materials will require special handling and placement. Site drainage conveyances include approximately 2,450 lf of vegetation lined "vee" bottom ditches, 4,200 lf of rock riprap "vee" bottom ditches, and 8,750 lf of flat bottom and broad crested spillway rock riprap channels. A 24-inch, twin 30-inch and 36-inch PE culvert will be installed in connection with construction of site drainage conveyances. Passive acid mine drainage treatment systems to be constructed include a Sediment Pond, a SAPS Pond, a Wetland Ditch, a Horizontal Limestone Bed Pond, a Fresh Water Storage Pond, a Steel Slag Leach Bed and three (3) associated Flush Ponds. Construction activities will include installation of custom and standard perforated underdrain piping systems and header pipes; solid outlet pipes (with anti-seep collars through embankments), various riser pipes, and construction of connector and outlet ditches between system structures. Outlet pipes will require either butterfly or screw gate valves to control flows and connector ditches will require construction and installation of flow measurement weirs. Other components of the passive treatment system include ODOT sized No. 2 Stone (limestone), Mushroom Compost and various sized Steel Slag.

L. Jane Hicks Senior Project Manager



23 YEARS EXPERIENCE

EDUCATION

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

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

Ms. Hicks has more than 20 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.



L. Jane Hicks

Senior Project Manager

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.

Higher Education

WVU Baseball Stadium, WVU, Morgantown Monongalia, WV*

Ms. Hicks served as geotechnical consultant during the preliminary planning stage of the WVU Baseball Stadium. The undeveloped site was underlain by several feet of coarse coal refuse. In addition, past deep mining activity was documented in two coal seams beneath the site. As part of the preliminary geotechnical investigation, subsidence and settlement risks were discussed. Jane developed a preliminary deep mine remediation plan and provided estimated fees for implementation of the plan to WVU to aid in planning.

WVU Coliseum Upgrades and Shell Building Additions, WVU, Morgantown Monongalia, WV*

Ms. Hicks planned a subsurface investigation to aid in the design of the planned coliseum upgrades and additions to the existing shell building, and provided a geotechnical report which provided earthwork and foundation recommendations. Portions of the existing structures had damages due to swelling pressures exerted by pyritic sulfur in the underlying black shale. Therefore, the recommendations included provisions to limit potential foundation and slab-on-grade movements.

Forensic Investigation

Forensic Investigations, West Virginia Board of Risk and Insurance Management, Charleston Various WV Counties, WV

Ms. Hicks has performed forensic investigations for more than ten years for properties whose owners filed for assistance through the WVBRIM. The typical project includes historical research to determine the extent of deep mining beneath the property in question, a site visit to document damages, and a report documenting finding and providing recommendations.

Coal

Upgrades to Bailey Complex, Consol Energy, Enon, PA*

Ms. Hicks supervised the geotechnical evaluation and provided deep foundation recommendations for proposed raw and clean coal silos and conveyor bent supports. Shallow foundation recommendations were also provided for various support structures.

Shoemaker Raw Coal Facilities, Consol Energy, Moundsville Marshall, WV*

Ms. Hicks supervised the excavation of test pits and compiled additional subsurface information from a drilling program for a proposed conveyor system to serve the Shoemaker Mine. The conveyor and service roadway were to be constructed on a steep, slide prone hillside. In addition, she investigated old landslides and performed stability analyses for different sections of the conveyor system. She also provided earthwork recommendations and deep foundation recommendations for the proposed bent structures.

Winding Way Slip Repairs, Clarksburg, West Virginia

Role: Project Manager

CEC will plan, coordinate, and execute the office and field work. CEC representatives have already visited the site, assessed the existing landslide conditions, and developed preliminary landslide remediation approaches, as described in Section 1.0. Based on the findings of the subsurface exploration, these approaches could change if another option is deemed more feasible. A site-specific Health and Safety Plan (HASP) will be generated for the safety of CEC representatives working at the site. The HASP will be used for all field work involved with the project

L. Jane Hicks
Senior Project Manager

South Gate Road Slope Stabilization Design, Preston County, Kingwood, West Virginia

Role: Project Manager

CEC will plan, coordinate, and execute the office and field work. CEC representatives will visit the site, assess the existing embankment and roadway conditions, and develop an embankment stabilization and roadway reconstruction approach. A site-specific Health and Safety Plan (HASP) will be generated for the safety of CEC representatives working at the site. The HASP will be used for all field work involved with the project.

** Work performed prior to joining CEC*

Christopher R. Haws, E.I.T.

Project Manager I



10 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering, West Virginia University, 2005

MBA, Business Administration, University of Phoenix, 2014

REGISTRATIONS

Engineer in Training

- WV [REDACTED]

Mr. Haws is an engineer with more than 10 years of experience in civil engineering, project management, and government relations.

Mr. Haws is experienced in the various aspects of land development, including large-scale residential subdivision design, grading and earthwork analysis, drainage design, water, sewer, and storm water system design, and commercial/multi-family site design. Mr. Haws has also worked with NPDES permitting, Asset Management Plan preparation, Abandoned Mine Land projects, Above Ground Storage Tank permitting and removal, and preliminary site evaluations.

Mr. Haws has experience with marketing, recruiting, and business development efforts.

PROJECT EXPERIENCE

Site Development

Smart Storage, Ann's Run Limited Liability Company, Bridgeport Harrison County, WV

Project Engineer. Ryan performed an analysis of the existing stormwater pond storage versus the ultimate capacity of the pond. This analysis was used to help the developer determine the remaining developable property.

Charles Pointe Mitigation , Genesis Partners, Limited Partnership, Bridgeport Harrison County, WV, USA

Project Engineer. Ryan coordinated with Ecological Services to complete the submittal of the 404(B)(1) permit. This included determining Limits of Disturbance, development areas, impacts exhibit creation, and client coordination.

Commercial Center Redesign , Multiple, Phoenix Maricopa County, AZ*

Project Engineer. Ryan was the design lead for a commercial center redesign including ADA compliance, and parking lot and drainage design.

Residential Site Development , Multiple, Phoenix Maricopa County, AZ, USA*

Design Lead. Ryan worked as the design lead for several 100+ acre residential subdivisions. He worked on all aspects of the design including site layout, grading, drainage, water and sewer, stormwater, roadway, and paving and striping plans

Rural Site Development , Multiple, Mesa Maricopa County, AZ*

Project Lead. Ryan was responsible for the overall design of a subdivision with significant offsite drainage concerns. His work included low-water crossing design, culvert and hydraulic analysis, and agency coordination.



Christopher R. Haws, E.I.T.

Project Manager I

Sports and Recreation Complex Feasibility Study, City of Bridgeport, Bridgeport Harrison County, WV*

Project Engineer. Ryan was the engineering representative on the team responsible for a feasibility study commissioned by the City of Bridgeport for a future Sports and Recreation Complex. Ryan performed preliminary earthwork calculations for multiple options, analyzed existing utilities, reviewed existing Geotechnical reports and traffic studies, reviewed existing stormwater management pond capacity, and created engineering estimates for all site work related to the proposed facility. He was responsible for compiling a narrative for all engineering related issues related to the site development and construction of the Bridgeport Sports and Recreation Complex.

Charles Pointe Crossing, Genesis Partners, Limited Partnership, Bridgeport Harrison, WV, U.S.A

Ryan was the project manager for Charles Pointe Crossing which involved moving 3.5 million cubic yards of earth and rock to create 100+ acres of development sites along I-79. His responsibilities included utility planning and coordination, budget review, addendum preparation, and overall project management.

Bridgeport Indoor Sports & Recreation Complex, City of Bridgeport, Bridgeport Harrison, WV

This project involved the design for a 125 acre indoor/outdoor sports and recreation complex. Mr. Haws was responsible for managing this project from design, utility/regulatory coordination, permitting, bidding, and construction management/administration.

Bridgeport Indoor Sports & Recreation Complex - Earthwork Phase, City of Bridgeport, Bridgeport, WV

Role: Project Manager

Charles Pointe Crossing - Site Development, Genesis Partners, Limited Partnership, Bridgeport, WV

Role: Project Manager

Bridgeport Indoor Sports and Rec Complex , Omni Associates - Architects, Bridgeport, WV

Role: Project Manager

The purpose of this project is to provide site development design, geotechnical engineering, construction administration, and construction observation services for the proposed IS&RC to be located adjacent to the existing Bridgeport Recreation Complex. The City of Bridgeport has asked that the site development design and bidding documents be completed to allow for construction to commence on Contract #1 – (Earthwork) in June of 2018.

Public Sector

Asset Management Plans, Multiple, Bridgeport Harrison County, WV, USA*

Project Engineer. Ryan was responsible for the creation of an Asset Management Plan in coordination with several water utilities. This involved evaluating system processes and data, working to create a method of tracking and monitoring system assets, planning for capital improvement projects, and tracking and performing appropriate O&M tasks.

Comprehensive Plan Update, City of Bridgeport, Bridgeport Harrison County, WV*

Project Engineer. Ryan participated in the creation of the most recent update to the Comprehensive Plan for the City of Bridgeport. He assisted with public meetings, stakeholder meetings, and narratives to be included in the plan update.

County-Wide Water Study, Doddridge County Public Service District, West Union Doddridge County, WV*

Client Liaison. Ryan was responsible for coordinating with the Doddridge County Public Service District Board for the completion of a county-wide water study. This included participating in public meetings and outreach and field verifying information to determine current water service and evaluate future service areas throughout the county.

Above Ground Storage Tanks (AST)

Above Ground Storage Tank Closures, Multiple, Bridgeport Multiple County, WV

Project Engineer. Ryan developed an Above Ground Storage Tank Closure report for several Oil & Gas Companies including sample collection and agency coordination.

Abandoned Mine Land (AML)

Christopher R. Haws, E.I.T.

Project Manager I

McAlpin Portals and Drainage, WVDEP, Bridgeport Harrison County, WV

Project Engineer. Ryan was responsible for responding to comments from the WVDEP on a previous submittal. This included adding additional ditches, ditch crossings, project estimates, quantities, and updating the Calculation Brief and all associated documents..

Belasco Waterline Project, Bridgeport, WV

Role: Project Manager

The design professionals in CEC's Bridgeport, WV office have the experience to maintain constant contact with the owner during each phase of the project. CEC will communicate with the City during the preliminary design phase to clearly establish the project goals, objectives, and budget and to design and plan accordingly. Throughout the design process, CEC will communicate with the City to ensure the construction of the design can be successfully completed while also minimizing disruption to City operations. Once the final design is accepted, the professionals at CEC will be able to follow the bidding requirements necessary for each respective project to acquire a qualified Contractor to construct the design. CEC can then provide the City with construction management to review progress and assist in resolving any issues that may arise during construction.

Town of Grant Town – Water Project, Grant Town, WV

Role: Project Manager

Civil & Environmental Consultants, Inc. (CEC) appreciates the opportunity to provide the Town of Grant Town with the attached Statement of Qualifications for the services you have requested. We are proud to offer the undivided attention of our experienced design professionals for the successful completion of your project. We trust the enclosed qualifications will provide you with the information you need to assess our qualifications to successfully complete your project.

** Work performed prior to joining CEC*

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers

Timothy A. Denicola, GIT, CFM

Project Manager II



10 YEARS EXPERIENCE

EDUCATION

M.S., Geology, West Virginia University, 2013

B.S., Chemistry, Clarion University of Pennsylvania, 2006

REGISTRATIONS

Geologist in Training
• PA [REDACTED]

CERTIFICATIONS

Certified Floodplain Manager,
Association of State Floodplain
Managers

Mr. Denicola is a project manager whose multi-disciplined background includes expertise in geochemistry, geology, and hydrology. His experience includes mine water remediation, ecosystem restoration, and environmental compliance. Specific capabilities include soil and water chemical analysis, hydrologic data collection, design of passive and semi-active treatment systems, design of stream restoration corridors, geotechnical soil and rock exploration drilling, construction quality assurance, environmental compliance, and development of various spill control plans. Mr. Denicola manages projects from conceptual through final completion in collaboration with a qualified team of personnel.

Mr. Denicola is adept at managing projects with personal experience in watershed based planning, laboratory analysis, software based geochemical and statistical evaluations, funding source identification and management, regulatory permitting, and construction specification, cost, and bid package preparation. Mr. Denicola has managed technical, administrative, and educational components related to watershed restoration, managed project and institutional budgets for non-profit, public and private clientele, communicated with landowners and local, state and federal agencies. Mr. Denicola has managed environmental regulatory compliance including aboveground storage tank (AST) inspections and preparation of Spill Prevention and Response Plans (SPRP), Spill Prevention Control and Countermeasure Plans (SPCC), Groundwater Protection Plans (GPP), and Stormwater Pollution Prevention Plans (SWPPP).

PROJECT EXPERIENCE

Mine Water Remediation | Watershed Restoration

Herods Run Passive Treatment Project, U.S. Army Corps of Engineers (USACE) Regional General & WV Department of Natural Resources (WVDNR), Upshur County, WV*

Herods Run is impacted by acidic, iron contaminated water emanating from an abandoned coal surface mine. Mr. Denicola prepared the winning conceptual design, developed the preliminary and final engineering design drawings, and prepared the construction specifications, cost estimates, and bid package. Mr. Denicola prepared permit application packages for the U.S. Army Corps of Engineers (USACE) Regional General for AML permit and WV Department of Natural Resources (WVDNR) Stream Activity permit. Throughout the project Mr. Denicola facilitated open communication between a non-profit watershed association, various landowners, and a private energy company owning easements.

Technical Assistance Grants Program, Trout Unlimited, PA Statewide*

Mr. Denicola participated as one of several on-call consultants for the Trout Unlimited (T.U.) Technical Assistance Grants (TAG) Program. Each year various entities request assistance from T.U. to complete existing abandoned mine water (AMD) treatment system assessments with recommendations for improvements, rapid AMD characterizations, and rapid watershed snapshots, develop conceptual designs for AMD treatment systems, conduct construction oversight of AMD treatment systems, develop monitoring plans. Mr. Denicola completed all tasks associated with each request totaling approximately six per year.

Semi-Active AMD Treatment, Sewickley Creek, Brinkerton, Westmoreland County, PA*

The Brinkerton Semi-Active AMD Treatment project was affected by a high volume of alkaline mine water discharge and the existing passive treatment system required refurbishment. Mr. Denicola assisted in redesign of a Maelstrom Oxidizer, pond berm stabilization, incorporation of top flow weirs to allow collection of chemical and hydrological data, and conversion of a smaller acidic



Timothy A. Denicola, GIT, CFM

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mine water collection area into an anoxic limestone drain. Mr. Denicola also performed construction oversight at various stages of project completion.

Active AMD Treatment Conceptual Design, Brubaker, Clearfield County, PA*

Mr. Denicola developed the winning conceptual design for active treatment at the abandoned Dean Clay Mine discharge in the Brubaker Run watershed. The design utilized calculations for acid neutralization and sludge production rates. The design included active treatment BMPs, surface water diversion and high flow bypasses, and a proposal for an on-site sludge disposal assessment requiring a geotechnical study of the nearby mine workings.

AMD Assessments and Recommendations,, Buck Mountain #2 and Lausanne Tunnel, Eastern Pennsylvania*

Several passive AMD treatment systems required an assessment and recommendations report to evaluate treatment efficacy. Mr. Denicola conducted chemical and hydrological sampling and completed an assessment of each location including recommendations and associated costs. Development of the recommendations required calculations of acid and metal loads, alkalinity generation and acid neutralization rates, ferrous iron oxidation rate, sludge volume, and BMP sizing for necessary hydrologic retention time.

Watershed Assessment, Lehigh River Basin*

Mr. Denicola was provided chemical data from approximately two dozen abandoned mine discharges (AMD) in several impaired subwatersheds of the Lehigh River. Utilizing spatial and statistical software, Mr. Denicola prepared an assessment and recommendations report identifying priority AMDs and priority subwatersheds for remediation. Based on geochemical calculations, site-specific treatment options were recommended including associated engineering and construction costs.

Severe AMD Characterized by High Acidity, Iron, and Aluminum, Satcher Pre-Treatment Pond (SPTP)*

The SPTP was constructed to handle severe AMD characterized by high acidity, iron, and aluminum. In 2013, the system required refurbishment. Chemical and hydrologic assessment, funding acquisition, design, and construction were completed by Mr. Denicola and the landowner. The resulting system is an improved flushing limestone bed with improved hydrologic capacity, acid neutralization, and metals removal.

AMD Remediation, Slabcamp Tributary, Preston County, WV*

Four severe AMDs are impairing a tributary to Slabcamp Run and a 5.4-acre wetland. Mr. Denicola completed pre-construction monitoring, execution of landowner right-of-entry agreements, acquisition of an environmental consulting firm, communication with the U.S. Army Corps of Engineers (USACE) regarding wetland and waterways permitting, communication with the State Historic Preservation Office (SHPO) to complete a Section 106 review, communication with West Virginia Department of Natural Resources (WVDNR) to complete a National Environmental Policy Act (NEPA) review and composed an Environmental Assessment (EA), communicated with Region VI Planning and Development Council for the necessary consultation letter, and assisted development of a conceptual design.

AMD Remediation,, Ingrand Mine, Preston County, WA*

Two severe AMDs impairing Dills Run required development of a passive remediation system. Mr. Denicola oversaw pre-construction monitoring, completion of land purchase through execution of a subdivided land deed, acquisition of an environmental consulting firm, communication with the USACE, SHPO, NEPA, and Region VI, and assisted development of a final design with associated specifications, bid, and contract documents. The passive treatment system utilizes a flushing limestone leach bed, two settling ponds, an anaerobic vertical flow wetland (AVFW), and a polishing wetland and is successfully reducing contaminant loads to Dills Run and Kanes Creek.

Valley Point #12 Refurbishment, Kanes Creek South Site #1 and Valley Highwall #3 Upgrades, Deckers Creek Watershed*

After years of successful acid neutralization and metals load reductions at numerous systems within the Deckers Creek Watershed, system efficacy had reduced at several systems and refurbishments were necessary. Mr. Denicola oversaw extensive system assessments and coordinated with landowners and the Deckers Creek Restoration team to facilitate improvements. The result was award of funding for two projects, a completed design for one, and a funding request for the final system.

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Successive Alkalinity Producing System and Active Lime Doser Assessments, Deckers Creek Watershed*

As a responsibility of project management, Mr. Denicola thoroughly audited all existing systems within the Deckers Creek watershed. The most extensive audits were conducted at a successive alkalinity producing system (SAPS) that utilizes flushing limestone leach beds, settling ponds, and an AVFW. Chemical, hydrologic, and redox potential data were collected, and geochemical software was utilized to evaluate the iron reducing capability of the AVFW, which ultimately proved to be highly successful. The SAPS was receiving AMD with pH=2.6 and high ferric iron and aluminum concentrations and was discharging water of circum-neutral pH with metals below minimum detection limits. The AVFW alone displayed a redox potential of -0.093 V and conversion of all ferric iron into the ferrous form. In addition, the Deckers Creek watershed utilizes two active tipping bucket lime dosers for neutralization of severely degrading AMD. Mr. Denicola thoroughly audited both active systems through a series of geochemical sampling and evaluation techniques. The results of the audits substantiated the necessity of future funding for refurbishment.

Geochemical Study, Richard Mine*

The Richard Mine discharges 400 gallons per minute of water characterized by pH=4.0 and high iron and aluminum concentrations. The discharge emanates from a partially flooded mine pool within a 2,300-acre mining complex. Treatment will require a full-scale active facility. To assess the design requirements, Mr. Denicola oversaw acquisition of an environmental consulting firm for successful installation of a 342-foot-deep monitoring well and assessed collected chemical data. To facilitate the project Mr. Denicola executed a notarized landowner entry agreement, obtained and evaluated mine maps, and utilized field pumps and transducers to monitor water level and chemistry of the Richard Mine pool.

Clean Creek Program, Friends of Deckers Creek*

Since 2002, the Friends of Deckers Creek has participated in the Clean Creek Program (CCP) which consists of quarterly chemical, biological, and flow sampling at 13 key locations along the 24-mile length of Deckers Creek. In addition, collected data are compiled into an annual State of the Creek Report for distribution to community members and funding agencies. Mr. Denicola took an active role in performing CCP duties, funding acquisition, and report writing.

AMD Treatment, Broad Top Township, Bedford County, PA*

Various active and passive AMD treatment systems currently operate within Broad Top Township. Mr. Denicola conducted geochemical calculations that directly translated into several passive system designs, conducted chemical and hydrological sampling as part of an assessment and recommendations study, and conducted the post-construction final inspection of the most recently construction AMD treatment system.

Kanes Creek South Site #3, Office of Surface Mining (OSM) Watershed Cooperative Agreement (WCAP), Preston County, WV*

Several acid mine discharges impairing Dills Run, required development of a passive remediation system. Mr. Denicola oversaw the final stages of system design, construction stormwater permitting, and West Virginia Non-Point Source (NPS) 319 and Office of Surface Mining (OSM) Watershed Cooperative Agreement (WCAP) grants management, as well as conducted construction oversight and completion of pre- and post-construction monitoring. The final system ultimately consists of a flushing limestone bed followed by two settling ponds in series. The system is successfully neutralizing all acidity, introducing residual alkalinity, and is removing all metals to analytical minimum detection limits.

Coalfields Expressway Habitat Assessment, WV*

Mr. Denicola obtained and interpreted mine maps from four coal beds to assist the ecological team. Dozens of historic mine openings were identified, thereby directing the ecological team to potential Indiana Bat hibernacula.

Environmental Compliance Audits, Various Locations in Pennsylvania, West Virginia and Kentucky*

Throughout 2015, Mr. Denicola conducted environmental compliance audits at regulated mining properties. Audits consisted of reviewing toxic waste inventories and hazardous materials handling, verifying that proper pond and fill certification protocols were met, and ensuring that NPDES daily monitoring and compliance was met.

* Work performed prior to joining CEC

Stream Restoration

Timothy A. Denicola, GIT, CFM

Project Manager II

Snake Run Stream Restoration, Greenbrier County, WV

The Snake Run Stream Restoration project addressed a 1,000 foot stream corridor displaying extensive aggradation and lateral migration across agricultural land. Mr. Denicola completed a geomorphic and topographic survey to collect bankfull, channel, berm, and thalweg data. From empirical data, Mr. Denicola produced a longitudinal profile and cross-sections, calculated appropriate bankfull area, shear stress, and stream power, and designed a restoration corridor including hydraulic structures and floodplain to return Snake Run to proper pattern, profile, and dimension.

Oxbow Mitigation Bank, Ritchie County, WV

The Oxbow Mitigation Bank will restore approximately 26,000 feet and enhance approximately 48,000 feet of heavily degraded stream corridor. The property has been heavily timbered and traversed with access routes resulting in excess sedimentation, disconnected stream channels, and reduced biological diversity. Off road vehicle traffic and the county right-of-ways utilize the stream corridor resulting in substantial geomorphic degradation. Mr. Denicola has managed and/or completed stream restoration designs, geotechnical rock drilling exploration, oil & gas infrastructure relocations, county right-of-way decommissioning, and contractor coordination to facilitate successful project completion.

Brushy Fork Mitigation Bank, Harrison, Barbour, Taylor Counties, WV

The Brushy Fork Mitigation Bank will restore approximately 95,000 feet of streams and 9.5 acres of wetland. Portions of the property were extensively coal mined and streams will be constructed into poor quality spoil with the potential for acid generation and iron precipitation. Mr. Denicola has conducted extensive chemical and hydrologic data collection to characterize the construction material and has selected various mitigation techniques to prevent negative spoil influences on water quality. A combination of alkaline reagent, organic compost, aerobic wetlands, impermeable liners, and spoil excavation will be utilized to ensure acceptable water quality beneficial to establishment of aquatic habitat post-construction.

Kanawha Mitigation Banks (Sapsucker Run and Yeager Fork), Mason County, WV

The Kanawha Mitigation Banks will restore, enhance, and preserve a combined 61,000 feet of stream and 1.1 acre of wetlands. The properties were heavily timbered and traversed by access routes. Surface disturbances have heavily altered hydrology and impacted stream corridor geomorphology, floodplain, vegetation, and ecological function. Mr. Denicola has completed geotechnical rock drilling exploration to identify suitable material for stream restoration hydraulic structures, composed site SWPPPs and filed the application paperwork for the NPDES Construction Stormwater Permit, and coordinated county right-of-way decommissioning.

Indian Creek Mitigation Bank, Ritchie County, WV

The Indian Creek Mitigation Bank will restore 12,000 feet of stream and 0.66 acre of wetlands. Mr. Denicola reviewed the USACE Section 404 Permit Application and managed completion of credit projections and associated supporting information to ensure conformance to 33 CFR 332.

Howards Creek Stream Restoration, Greenbrier County, WV

The Howards Creek Stream Restoration will address a 4,000 foot stream corridor displaying impacts from urban development and channelization. Mr. Denicola oversaw aerial mapping to collect high resolution LIDAR and orthoimagery, and personally completed a geomorphic survey to collect water surface and thalweg data. High-resolution LIDAR imagery was used to identify bankfull and berm features. All empirical data will be utilized to calculate bankfull area, shear stress, and stream power, and to compose a stream enhancement plan. Stream enhancement will achieve greater flood management in an area where standard restoration techniques are restricted by development.

Regulatory Compliance

Regulatory Compliance, Antero Treatment, LLC., Doddridge County, WV

Antero Treatment, LLC, operates a water treatment facility that requires onsite storage and handling of industry wastewater and regulated reagents. Mr. Denicola became intimately familiar with site-specific processes and oversaw completion of Aboveground Storage Tank (AST) fit-for-service inspections. Mr. Denicola personally developed the Spill Prevention Response Plan (SPRP) and Spill Prevention Control and Countermeasure (SPCC) Plan in conformance with 47 CSR 63 and 40 CFR 112, respectively. Mr. Denicola prepared spill compliance training documentation and administered training to Antero personnel.

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Water Quality Monitoring, Antero Treatment, LLC, Doddridge County, WV

Antero Treatment, LLC, as a requirement of federal, state, and local regulation requires environmental monitoring. Mr. Denicola performed stream and site-specific water quality and hydrologic monitoring in support of company operations. Monitoring included collection of field chemical parameters and laboratory samples for analysis of volatile organic compounds, poly-nuclear aromatic hydrocarbons, phthalate esters, petroleum related oils, metals, anions, and radionuclides. Monitoring required analysis of gases including methane and dihydrogen sulfide. Flow data was collected using a USGS Wading Rod with a Marsh-McBirney flow meter and the cross-sectional area method.

Regulated Mining Property AMD Treatment and Refuse Research Study, Sequatchie County, TN*

An extensively reclaimed, regulated mining property treats acidic groundwater emanating from various locations. Mr. Denicola conducted an assessment of various treatment options ultimately identifying a potentially more cost-effective method of meeting NPDES compliance at several discharge points. In addition, Mr. Denicola was involved with a treatment test cell study to assess techniques for mitigating acid production in mine spoil, in attempt to eliminate the need for long-term AMD treatment.

Watershed Based Plan and Quality Assurance Protection Plan, WV*

As a responsibility of project management, Mr. Denicola composed a Watershed Based Plan (WBP) and Quality Assurance Protection Plan (QAPP) for approval by the United States Environmental Protection Agency (U.S. EPA). The WBP identifies priority remediation sites to meet compliance with West Virginia Department of Environmental Protection (WVDEP) Total Maximum Daily Loads (TMDL) requirements for the WV 303(d) list of impaired streams. In addition, Mr. Denicola composed a QAPP to ensure that the U.S. EPA-accepted sampling and data handling protocols were being utilized universally across all staff members and sampling events within the watershed.

Public Sector | State

Gas Well Abandonment, PA*

A Pennsylvania highway expansion required the plugging and abandonment of a relic gas well. Mr. Denicola acted as the Health and Safety Officer, oversaw all on-site activities, reviewed daily site activities with the contracted driller, and ensured that all required state approvals and paperwork were diligently submitted.

ATV Trail System Development, VA*

Mr. Denicola assisted in conducting the design and geospatial mapping of a recreational ATV trail system. Trail design followed a specific set of protocols to manage stormwater, thereby reducing erosion and sedimentation impacts and long-term operations and maintenance costs. The protocols required that Mr. Denicola conduct soil studies utilizing the Natural Resources Conservation Service soils database.

TRAINING

Rosgen Level I: Applied Fluvial Geomorphology

Rosgen Level II: River Morphology and Applications

Rosgen Level III: River Assessment and Monitoring

PUBLICATIONS

Updates to Deckers Creek Watershed Based Plan. Friends of Deckers Creek, Monongalia County, West Virginia. November 2014.

Quality Assurance Protection Plan, Deckers Creek Watershed, West Virginia. Friends of Deckers Creek, Monongalia County, West Virginia. November 2013.

Geochemistry of Mine Pool Discharges in the Pittsburgh Coal Basin. West Virginia University Electronic Thesis and Dissertation. August, 2013.

PRESENTATIONS

In Proceedings, Geological Society of America, Denver, Colorado; October 2013: Geochemistry of Mine Pool Discharges in the Pittsburgh Coal Basin. Paper No. 245-9. Denicola, T. 2013.

Timothy A. Denicola, GIT, CFM

Project Manager II

Mid-Atlantic Stream Restoration Conference, Baltimore, Maryland; September 2017: Stream Restoration on Coal Mining Impacted Properties, West Virginia. Civil & Environmental Consultants, Inc., Bridgeport, WV.

West Virginia Mine Drainage Symposium, Morgantown, West Virginia; March 2018: Stream Restoration in Mining Impacted Watersheds, WV. Civil & Environmental Consultants, Inc., Bridgeport, WV.

Mid-Atlantic Stream Restoration Conference, Baltimore, Maryland; November 2019: Floodway Improvements & Habitat Restoration Post-Disaster, Howards Creek, West Virginia. Civil & Environmental Consultants, Inc., Bridgeport, WV.

Robert Stewart, Ph.D., E.I.T.

Project Manager I



6 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering, Tennessee Technological University, 2009

M.S., Civil Engineering, University of Kentucky, 2009

Ph.D., Civil Engineering, University of Kentucky, 2014

REGISTRATIONS

Engineer in Training

- TN [REDACTED]

Robert is a professional ecosystem restoration designer with over 6 years of experience working on private and public sector projects. He has expertise and multiple publications in the fields of open channel hydraulics, sediment transport, and geomorphology. Robert has worked on a variety of research and restoration projects in many different ecosystems and geographic provinces and states including CA, KY, MD, NC, PA, SC, and WV. Ecosystem restoration project experience includes existing conditions site survey, hydrologic and hydraulic modelling, stream and wetland design, species specific habitat estimations, construction quality assurance, project management, as-built survey, and post construction project monitoring. Robert has over 10 miles of stream restoration design experience. Robert uses his expertise in 2D hydraulic modelling, sediment transport, and natural channel design principles to develop innovative sustainable ecosystem restoration solutions constrained by site-specific constraints to meet project goals.

PROJECT EXPERIENCE

Deep Gulch, US Bureau of Reclamation, Junction City, Trinity County, CA*

Robert worked with public land managers as well as private property owners during the design and implementation of this salmon habitat restoration project. Robert used AutoCADD and hydraulic modeling to create a surface that provided appropriate depth and velocity characteristics for juvenile Chinook salmon while ensuring that the project would be self-sustaining into the future.

Sediment Transport in the Trinity River, CA: Data Synthesis, TRRP, Weaverville, Trinity County, CA*

Robert collaborated with a fluvial geomorphologist to summarize a decade of fine and coarse sediment transport monitoring efforts. This analysis identified spatial temporal trends in transport rates and described how these trends relate to sediment management objectives.

Dutch Creek, California Department of Water Resources, Junction City, Trinity County, CA*

Robert provided engineering support to propel the Dutch Creek project from a conceptual level design to a completed peer-reviewed 30% design report. Project objectives include providing appropriate depth and velocity characteristics for juvenile Chinook Salmon, establishing a self-perpetuating channel morphology, and creating floodplains to naturally recruit riparian vegetation. To meet these objectives Robert analyzed local hydrology and determined the range flows most commonly experienced by juvenile Chinook salmon. The hydrologic analysis also identified flows that should be targeted during the riparian recruitment window. Surfaces were graded in AutoCAD and analyzed using a hydraulic model to evaluate the ability of the proposed surface to increase juvenile Chinook habitat.

Trinity River Delta Monitoring, Trinity River Restoration Program, Weaverville, Trinity County, CA*

Robert designed and implemented a survey routine to monitor tributary derived coarse sediment delivery to the Trinity River. The project combined a variety of survey techniques including sonar, photogrammetry, Lidar, GPS, and conventional survey to monitor changes in topography following flooding events. This monitoring effort reduced uncertainty in coarse sediment delivery down from a factor of about 70% to around 15%.



Robert Stewart, Ph.D., E.I.T.

Project Manager I

Yeager, Ecosystem Investment Partners, WV

Robert used two-dimensional hydraulic modelling to value engineer the Yeager stream restoration design and improve project performance. He designed over 3,800 feet of stream restoration with this project. Robert provided onsite review of construction activities and recommended modifications when unforeseen site conditions arose.

Howard's Creek, West Virginia Conservation Agency, White Sulfur Springs, Greenbriar County, WV

Robert and colleagues conducted a geomorphic survey of Howard's Creek following the 2016 flood that resulted in major property damage. Using AutoCADD Civil 3D and two dimensional hydraulic modelling Robert created a stream restoration design of 2,500 feet to provide long-term stability of the stream and improve aquatic habitat for trout.

Four Mile Run, Pittsburgh Water and Sewer Authority, Pittsburgh, PA

As Assistant Project Manager, Robert led the detailed stream survey efforts of 6,250 feet of stream. Streams were assessed for stability, sediment supply, and hydraulic capacity. During urbanization and the industrial revolution over a mile of stream was buried in brick sewer conduits approximately 65 feet below current grade. Robert completed the design of 6,250 feet of stream restoration and 2,750 feet of stream daylighting.

Tyger Mitigation Bank, South Carolina

Role: Project Manager, Lead Designer

Stream and wetland survey, permitting, and design project for mitigation bank to restore, enhance, reestablish, and preserve 71,520 feet of streams, 12.39 acres of wetlands, and 458 acres of riparian and upland buffers within the 581-acre bank.

Rj Smith Slide, Doddridge County WV

Role: Project Manager, Lead Designer

Restore approximately 1,000 feet of stream impacted by a landslide. Design included the engineering of a dewatering system to enable slide material to be handled. Restoration design included using a combination of boulder and log cascades and boulder steps to create a stepped bed morphology.

Landsford, Chester County South Carolina

Role: Project Manager, Lead Designer

Design of 7,225 linear feet of stream restoration in the Piedmont region of South Carolina. The project design used a combination of log and boulder grade controls to create step bed morphology on steep incised head water streams and bioengineering on low gradient systems to provide ecological uplift.

** Work performed prior to joining CEC*

PROFESSIONAL AFFILIATIONS

American Geological Society

American Society of Civil Engineers

PUBLICATIONS

Stewart, R. L., & Fox, J. F. (2017). Outer region scaling using the freestream velocity for nonuniform open channel flow over gravel. *Advances in Water Resources*, 104, 271-283.

Stewart, R. L., & Fox, J. F. (2015). Role of macroturbulence to sustain turbulent energy in decelerating flows over a gravel bed. *Geomorphology*, 248, 147-160.

Stewart, R. L., & Fox, J. F. (2017). Light Attenuation Model for Waters: Linear and Nonlinear Dependencies on Suspended Sediment. *Journal of Hydraulic Engineering*, 143(9), 04017033.

Stewart, R. L., Fox, J. F., & Harnett, C. K. (2014). Estimating suspended sediment concentration in streams by diffuse light attenuation. *Journal of Hydraulic Engineering*, 140(8), 04014033.

Schmandt, B., Gaeuman, D., Stewart, R., Hansen, S. M., Tsai, V. C., & Smith, J. (2017). Seismic array constraints on reach-scale bedload transport. *Geology*, 45(4), 299-302.

Robert Stewart, Ph.D., E.I.T.

Project Manager I

- Fox, J. F., & Stewart, R. L. (2014). Mixed Scaling for Open-Channel Flow over Gravel and Cobbles. *Journal of Engineering Mechanics*, 140(10), 06014010.
- Stewart, R. L., Fox, J. F., & Harnett, C. K. (2012). Time-Average Velocity and Turbulence Measurement Using Wireless Bend Sensors in an Open Channel with a Rough Bed. *Journal of Hydraulic Engineering*, 139(7), 696-706.
- Schmandt, B., Gaeuman, D., Stewart, R., Hansen, S. M., Tsai, V. C., & Smith, J. (2017). Seismic array constraints on reach-scale bedload transport. *Geology*, 45(4), 299-302.
- Gaeuman, D., Stewart, R. L., Schmandt, B., & Pryor, C. (2017) Geomorphic response to gravel augmentation and high-flow dam release in the Trinity River, California. *Earth Surface Processes and Landforms*.
- Gaeuman, D., Stewart, R. L., & Pittman, S. (2018). Toward the prediction of bed load rating curve parameter values: The influence of scale, particle size, and entrainment threshold. *Water Resources Research*, 54. <https://doi.org/10.1002/2017WR021627>

PRESENTATIONS

- Stewart, R. L., & Gaeuman, D. Examination of High Resolution Channel Topography to Determine Suitable Metrics to Characterize Morphological Complexity. AGU Fall Meeting, San Francisco California, December 2015
- Stewart RL, Gaeuman D. Geomorphic Response of Trinity River Tributary Deltas under High Flow Restoration Hydrology, In AGU Fall Meeting Abstracts , San Francisco CA, 2016 Feb.
- Stewart R. L., Fox J. F., and Harnett C. K., Time Average Velocity Characteristics of Decelerating Open Channel Flows, Kentucky Water Resources Annual Symposium, Lexington, KY, March 10, 2014
- Stewart R. L., Fox J. F., Harnett C. K., and Husic A., Environmental Sensor Network for Watershed Monitoring Louisville, KY, Oct 17, 2013 KY EPSCoR Annual Conference
- Stewart R. L., Fox J. F., and Harnett C. K., Dimensionless Light Attenuation Number for Modeling Suspended Sediment Concentration in Open Channels, 2013 World Environmental & Water Resources Congress, EWRI, ASCE, Cincinnati, Ohio, May 19-23, 2013
- Fox, J. F. and Stewart, R. L., Scaling of the Outer Region for Turbulent Open Channel Flow Modeling over Gravel Beds, 2013 World Environmental & Water Resources Congress, EWRI, ASCE, Cincinnati, Ohio, May 19-23, 2013
- Stewart R. L., Fox J. F., and Harnett C. K., Velocity Bend Sensor Results for Modeling Mean Velocity and Turbulence in Open Channels, 2013 World Environmental & Water Resources Congress, EWRI, ASCE, Cincinnati, Ohio, May 19-23, 2013
- Stewart R. L., Fox J. F., and Harnett C. K., Sensor Network for Suspended Sediment Monitoring, Kentucky Water Resources Annual Symposium, Lexington, KY, March 18, 2013
- Stewart, R. L., Fox, J. F., and Harnett, C. K., Sediment Transport Measurements for Intelligent Sensor Networks, Hydraulic Measurement and Experimentation Meeting 2012, ASCE Hydraulics Division, Snowbird, Utah, August 12-15, 2012
- Stewart, R. L., Lawrence, T., Fox, J. F., and Harnett, C. K., Laboratory Calibration of Experimental Velocity and Sediment Concentration Sensors to Monitor Water and the Environment, Kentucky Water Resources Annual Symposium, Lexington, KY, March 19, 2012
- Stewart, R. L. and Fox, J. F., Development of New Sensors for Monitoring Velocity and Sediment Discharge in a Watershed, World Environmental & Water Resources Congress 2011: Bearing Knowledge for Sustainability, Palm Springs, California, May 22-26, 2011
- Stewart, R. L., Ford, W., Fox, J. F., and Harnett, C. K., Development of New Sensors for Monitoring Velocity and Sediment Discharge in a Watershed, Kentucky Water Resources Annual Symposium, Lexington, KY, March 21, 2011
- Stewart, R. L., Fox, J. F., and Harnett, C. K., Real Time Sediment Discharge Estimates Using a Turbidity and Velocity Bend Sensor Network, Kentucky Water Resources Annual Symposium, Lexington, KY, March 22, 2010

**Appendix D -
Related Project Experience**



BAILEY MINE: COAL REFUSE DISPOSAL AREAS NO. 7 AND NO. 8

OWNER/CLIENT

Consol Pennsylvania Coal Company LLC

LOCATION

Greene County, PA

CEC SERVICES

Aquatic & Terrestrial Habitat Surveys

Clean Water Act, Section 401/404 Permitting

Fish and Macroinvertebrate Surveys

Threatened & Endangered Species Surveys/Wildlife Surveys

Wetlands & Waters Delineations

OWNER OBJECTIVE

Consol Pennsylvania Coal Company LLC (CPCC) retained CEC as its ecological consultant for the Section 401 and 404 permitting of a new 1,736-acre-coal refuse disposal site located in Greene County, Pennsylvania. The project affected two valleys for construction of a coarse coal refuse pile and a fine coal refuse slurry impoundment.

CEC APPROACH

CEC was tasked with collecting and analyzing baseline biological data on streams and wetlands, quantifying ecological impacts, resolving threatened and endangered species issues, preparing the biological portions of the Pennsylvania Department of Environmental Protection (PADEP) Coal Mining Activity Permit, preparing the United States Army Corps of Engineers (USACE) Individual Section 404 permit, and designing a stream and wetland mitigation plan. The project resulted in unavoidable impacts to approximately 83,822 linear feet of streams and 23.2 acres of wetlands. CEC developed the mitigation for a minor portion of the impacts and the remaining mitigation was provided through purchase of credits from a third-party mitigation banking company.

As part of the permitting process, CEC developed a cumulative impact assessment to assess the probability of effect of the current project and other mining-related projects (past and future) within the 42-square-mile upper Enlow Fork watershed. This task included assessments of socioeconomic benefits, stream and wetland impacts and mitigation, land use, stream condition, and water quality.

CEC negotiated seven permit approvals on behalf of CPCC, including multiagency reviews and approvals by the USACE, United States Environmental Protection Agency, United States Fish and Wildlife Service, PADEP, Pennsylvania Game Commission, Pennsylvania Fish & Boat Commission, and Greene County Conservation District.



Stream mitigation November 2017



Stream mitigation July 2020



Coal Refuse Disposal Area No. 7 and No. 8



BAILEY MINE - COAL REFUSE DISPOSAL AREAS NO. 5 AND NO. 6

OWNER/CLIENT

Consol Pennsylvania Coal Company LLC

LOCATION

Richhill Township, Greene County, PA

CEC SERVICES

Wetland and Stream Delineation

Wetland and Stream Functional Assessments

USACE Jurisdictional Determination

CWA 404/401 Permitting for refuse site

Mitigation Plan Design and Functional Performance Standard Development

PA Water Encroachment and NPDES Permitting for Mitigation

Mitigation Construction Oversight, As-builts, and Monitoring

OWNER OBJECTIVE

Consol Pennsylvania Coal Company LLC (CPCC) retained CEC as its ecological consultant for the Section 401 and 404 permitting of a new 750-acre coal refuse disposal site located in Greene County, Pennsylvania. The project affected two valleys for construction of a coarse coal refuse pile and a fine coal refuse slurry impoundment.

CEC APPROACH

CEC was tasked with collecting and analyzing baseline biological data on streams and wetlands, quantifying ecological impacts, resolving threatened and endangered species issues, preparing the biological portions of the Pennsylvania Department of Environmental Protection (PADEP) Coal Mining Activity Permit, preparing the United States Army Corps of Engineers (USACE) Individual Section 404 permit, and designing the stream and wetland mitigation plan. The project resulted in unavoidable impacts to approximately 32,251 linear feet of streams and 5.9 acres of wetlands.

As part of the permitting process, CEC developed a cumulative impact assessment to assess the probably effect of the current project and other mining-related projects (past and future) within the 42-square-mile upper Enlow Fork watershed. This task included assessments of socioeconomic benefits, stream and wetland impacts and mitigation, land use, stream condition, and water quality.

To offset the loss of ecological functions at the project site, CEC developed a mitigation plan to restore 40,413 linear feet of highly degraded stream, establish and/or preserve a minimum of 25 feet of wooded riparian buffers, create 6.3 acres of diverse wetland habitat, and preserve 1.3 acres of riparian wetland. The project took four years to construct and CEC was responsible for the construction oversight, as-built reporting, and monitoring.

CEC provided contiguous restoration and hydrologic connectivity between existing restoration projects in order to maximize the physical and biological potential of all projects. CEC worked in collaboration with the client's land agents to obtain access and conservation easements from nine different landowners. The mitigation project achieved the performance standards and was released from further monitoring obligations by the PADEP and the USACE.

CEC negotiated seven permit approvals on behalf of CPCC, including multiagency reviews and approvals by the USACE, the United States Environmental Protection Agency, the United States Fish and Wildlife Service, PADEP, Pennsylvania Game Commission, Pennsylvania Fish & Boat Commission, and WCCD



Coal Refuse Disposal Area No. 5 and No. 6



ARKWRIGHT SLURRY IMPOUNDMENT

OWNER/CLIENT

CONSOL Energy, LLC/CNX Land
Resources (Owner)
Mon-View LLC. (Client)

LOCATION

Monongalia County, WV

CEC SERVICES

Cone Penetrometer Testing
Geotechnical Investigation
Settlement Evaluation
Flood Routing
Site Grading Analysis
Closure Plan
Revegetation
Construction Support

OWNER OBJECTIVE

After the closure of the Arkwright mining complex near Morgantown, West Virginia, CONSOL Energy, LLC (CONSOL) opted to develop the site for commercial use. CONSOL contracted CEC to generate a closure plan for an inactive fine coal refuse (FCR) slurry impoundment. FCR is material contained within a slurry generated by the coal preparation process that settles and consolidates over time.

CEC APPROACH

CEC performed a geotechnical investigation and analysis, and provided a closure plan for the inactive FCR slurry impoundment. Piezo-Cone Penetrometer Testing (CPTU) was performed in the impoundment to assess the stability and compressibility of the FCR materials, and piezometers were installed within the impoundment and embankment.

CEC's investigation and analysis of the CPTU data determined that the impoundment and FCR was well-drained and that the FCR materials would compress up to 3.5 feet under the backfill placed during the closure of the impoundment. Consequently, no specialized treatments (such as grouting or wick drains) were needed to stabilize the FCR materials prior to development. Some areas, depending on the postdevelopment use, received fill surcharges to induce settlements prior to development. Settlement monitoring data was collected and analyzed in these areas prior to surcharge removal and final site development activities.

Closure of the impoundment entailed a complete breach of the embankment, and excavation and placement of approximately 1,300,000 cubic yards of fill. At completion, the site provided approximately 40 acres of level development area within the former mine waste disposal facility, of which approximately 30 acres were purchased by Wal-Mart Stores, Inc. for the construction of a new Wal-Mart Supercenter and Sam's Club.



LOWER DEMPSEY STREAM RESTORATION ON AML

OWNER/CLIENT

Ecosystem Investment Partners, LLC
Canaan Valley Institute, Inc.

LOCATION

Logan County, WV

CEC SERVICES

- Topographic and Aerial Mapping
- Stream and Wetland I&D
- WV Stream and Wetland Valuation Metric (SWVM)
- Boundary Retracement Survey
- Geomorphic Survey
- Geotechnical Investigation
- Erosion & Sediment Control Plan
- Access Road Design
- Mitigation Plan and Design
- Construction Drawings
- Site Grading / Earthwork Analysis
- Hydrologic Assessment
- Ecological Permitting
- Construction Quality Assurance (CQA)
- As-Built Surveying
- Long-Term Performance Monitoring

OWNER OBJECTIVE

The Lower Dempsey Stream Mitigation Bank is located in Logan, West Virginia and demonstrates an innovative approach to restoration of abandoned mine lands and silvicultural practices. This stream mitigation bank was developed by Ecosystem Investment Partners, LLC (EIP) in partnership with Canaan Valley Institute (CVI) and Civil & Environmental Consultants, Inc. (CEC).

CEC APPROACH

The restoration includes streams across highwall mine benches; mine access roads built in the stream or its floodplain; failing or "hanging" pipe culverts; and severe erosion and down-cutting. Some project challenges included restoration of steeply sloping headwater streams, reclamation of mined landscapes and valleys, the construction of alluvial fans, and surface and subsurface hydrological improvement. Geo-synthetic liner was utilized to ensure effective surface water conveyance over unconsolidated fill. Natural stream design methodology was utilized to ensure geomorphic stability and reestablishment of aquatic ecosystem. A diverse, native, non-invasive revegetation plan ensured ecological improvements, riparian stability, and less thermal impact to surface waters.





ARLINGTON (GAIN) HIGHWALL

OWNER/CLIENT

West Virginia Department of
Environmental Protection

LOCATION

Arlington, WV

CEC SERVICES

Site Grading/Earthwork Analysis
Stormwater Management/BMP Design
Hydrogeology and Groundwater Modeling
Groundwater/Surface Water Remediation
Systems
Topographic Surveys
Calculation Brief
Construction Plans and Specifications
Bid Estimate and Engineer's Cost Estimate

OWNER OBJECTIVE

The West Virginia Department of Environmental Protection (WVDEP), Office of Abandoned Mine Lands oversees and facilitates the resolving of public safety issues as mine fires & subsidence, hazardous highwalls, mining-impacted water supplies, open shafts and portals, and other dangers resulting from mining before 1977. Such practices were established by the Surface Mining and Control Act and the creation of the Office of AML&R in 1981. The Office of Surface Mining provides oversight to the Office of AML&R.

CEC APPROACH

CEC performed a field visit to identify the problem area and make recommendations for elimination of the hazard. CEC provided GPS field survey tasks to map the problem area.

The project involved 570 linear feet of sediment control; 210 feet of ditches; 260 feet of pipes; 130 linear feet of subsurface drains; one manhole; one drop inlet; one headwall; one acre of Revegetation; topographic surveying to generate project mapping; hydraulic studies and design for ditches and pipes; sediment control design; revegetation plan; preliminary and final design; construction plans and specifications; engineers cost estimate, bid schedule, and calculation brief; initial onsite, preliminary design, pre-bid meeting; monthly reports and invoicing.

The project was completed in June 2015.



CAMDEN (HARTLEY) DANGEROUS LANDSLIDE

OWNER/CLIENT

West Virginia Department of
Environmental Protection

LOCATION

Camden, WV

CEC SERVICES

Site Grading/Earthwork Analysis
Stormwater Management/BMP Design
Hydrogeology and Groundwater Modeling
Groundwater/Surface Water Remediation
Systems
Topographic Surveys
Calculation Brief
Construction Plans and Specifications
Bid Estimate and Engineer's Cost Estimate

OWNER OBJECTIVE

The West Virginia Department of Environmental Protection (WVDEP) was working towards reclamation of the Camden (Hartley) Dangerous Landslide Abandoned Mine Lands, located near Camden in Lewis County, West Virginia. A pre-SMCRA cast-over-the-hill mine spoil was slipping and threatening four houses.

CEC APPROACH

CEC was awarded a contract to perform engineering services for the reclamation design of the Camden (Hartley) Dangerous Landslide Abandoned Mine Lands Project. CEC performed field surveying tasks to complement aerial mapping supplied by the DEP; developed and implemented a detailed subsurface investigation to determine the stability of the cast-over-the-hill mine spoil in the project area; and performed a detailed preliminary investigation to include public and private records. The preliminary investigation obtained available mine maps, interviewed affected landowners, evaluated construction and drill access, and located sources for materials to be used in reclamation of the project.

CEC developed reclamation cost alternatives that compared installation of a retaining structure by removing cast-over-the-hill spoil to a stable configuration. CEC designed approximately 500 linear feet of ditches; 200 linear feet of subsurface drains; and hydraulic and hydrologic analyses for project area pipes. CEC also performed topographic surveying; generated construction mapping; analyzed soil test results to determine soil amendments for vigorous vegetative growth; developed sediment control design as well as submitted an NPDES permit for the project; developed preliminary and final design construction plans and specifications; designed mine pool dewatering operations and mine drainage treatment plans; developed an engineer's cost estimate, bid schedule, and calculation brief; attended initial on-site, preliminary design, and final design meetings.

The project was completed in September 2014..



HODGESVILLE (WRIGHT) MINE BLOW-OUT

OWNER/CLIENT

West Virginia Department of
Environmental Protection

LOCATION

Hodgesville, WV

CEC SERVICES

Site Grading/Earthwork Analysis
Stormwater Management/BMP Design
Hydrogeology and Groundwater Modeling
Groundwater/Surface Water Remediation
Systems
Topographic Surveys
Calculation Brief
Construction Plans and Specifications
Bid Estimate and Engineer's Cost Estimate

OWNER OBJECTIVE

The West Virginia Department of Environmental Protection (WVDEP), Office of Abandoned Mine Lands oversees and facilitates the resolving of public safety issues as mine fires & subsidence, hazardous highwalls, mining-impacted water supplies, open shafts and portals, and other dangers resulting from mining before 1977. Such practices were established by the Surface Mining and Control Act and the creation of the Office of AML&R in 1981. The Office of Surface Mining provides oversight to the Office of AML&R.

The WVDEP, Office of Abandoned Mine Lands requested proposals to provide design services to mitigate problems associated with an unexpected mine blow-out. This project was deemed an emergency project with a very short time frame for document submittal and awarding of the construction contract. The problem area was located approximately 300 feet behind a residence. On or about March 17, 2015 a mine blowout sent uncontrolled high flows of mine water down an existing ditchline. The uncontrolled flow sent mud, debris, and sediment down the ditchline plugging an existing drop inlet and pipe beneath US Route 20 and submerging US Route 20 beneath 10 inches of water for a period of time causing the road to be closed to traffic. After the initial surge, a 25-foot diameter pool approximately three feet deep developed directly adjacent to US Route 20 with the overflow directed down the east road ditchline. The West Virginia Department of Highways had removed debris from atop the drop inlet and re-established flow through the road pipe. The outlet end of the road pipe is submerged with mud and debris with water conveyed by the road pipe welling-up out of the ground and sheet flowing into nearby ditches

CEC APPROACH

CEC's reclamation design included 12,500 cubic yards of excavation; two wet mine seals; 1,900 linear feet of sediment control; 531 linear feet of ditches; 116 feet of pipes; 355 linear feet of subsurface drains; one manhole; four acres of revegetation; topographic surveying to develop project mapping; soil testing; hydraulic studies and design for ditches and pipes; sediment control design; revegetation plan; preliminary and final design; construction plans and specifications; dewatering and AMD Treatment Plan; engineers cost estimate, bid schedule, and calculation brief; initial on-site, preliminary design, pre-bid meeting; monthly reports and invoicing.

The project was completed in November 2015.



LOWER DEMPSEY STREAM RESTORATION ON AML

OWNER/CLIENT

Ecosystem Investment Partners, LLC
Canaan Valley Institute, Inc.

LOCATION

Logan County, WV

CEC SERVICES

- Topographic and Aerial Mapping
- Stream and Wetland I&D
- WV Stream and Wetland Valuation Metric (SWVM)
- Boundary Retracement Survey
- Geomorphic Survey
- Geotechnical Investigation
- Erosion & Sediment Control Plan
- Access Road Design
- Mitigation Plan and Design
- Construction Drawings
- Site Grading / Earthwork Analysis
- Hydrologic Assessment
- Ecological Permitting
- Construction Quality Assurance (CQA)
- As-Built Surveying
- Long-Term Performance Monitoring

OWNER OBJECTIVE

The Lower Dempsey Stream Mitigation Bank is located in Logan, West Virginia and demonstrates an innovative approach to restoration of abandoned mine lands and silvicultural practices. This stream mitigation bank was developed by Ecosystem Investment Partners, LLC (EIP) in partnership with Canaan Valley Institute (CVI) and Civil & Environmental Consultants, Inc. (CEC).

CEC APPROACH

The restoration includes streams across highwall mine benches; mine access roads built in the stream or its floodplain; failing or "hanging" pipe culverts; and severe erosion and down-cutting. Some project challenges included restoration of steeply sloping headwater streams, reclamation of mined landscapes and valleys, the construction of alluvial fans, and surface and subsurface hydrological improvement. Geo-synthetic liner was utilized to ensure effective surface water conveyance over unconsolidated fill. Natural stream design methodology was utilized to ensure geomorphic stability and reestablishment of aquatic ecosystem. A diverse, native, non-invasive revegetation plan ensured ecological improvements, riparian stability, and less thermal impact to surface waters.





RECLAMATION OF FOUR BOND FORFEITURE SITES

OWNER/CLIENT

Stantec, Inc.

LOCATION

Northern WV

CEC SERVICES

- Site Grading/Earthwork Analysis
- Stormwater Management/BMP Design
- Hydrogeology and Groundwater Modeling
- Groundwater/Surface Water Remediation Systems
- Coal Refuse and Pavement Neutralization
- Landowner Negotiations
- Topographic Surveys
- Calculation Brief
- Construction Plans and Specifications
- Bid Estimate and Engineer's Cost Estimate

OWNER OBJECTIVE

Stantec, Inc. is an international professional services company in the design and consulting industry that has more than 400 locations in North America and 7 locations internationally. Stantec was seeking assistance with reclamation projects at five bond forfeited sites in northern West Virginia. The sites include three RobLee Coal Company mines, one Energy Marking Company mine and one Buffalo Coal Company mine.

CEC APPROACH

Stantec awarded CEC the contract to develop reclamation plans for the five bond forfeited sites. CEC began the project by obtaining rights-of-entry from 12 different landowners as well as having those landowners sign waivers for access roads and ponds constructed by the mine operations. In addition, CEC was tasked with developing and implementing subsurface investigations, obtaining aerial photography with field control surveys, supplementing aerial photography with onsite field surveys, obtaining soil and refuse analyses, and reclamation design.

CEC performed topographic surveying and generated construction plans and specifications for the five project sites prior to construction. Improvements to 2.5 miles of access roads also had to take place before construction could begin.

The projects involved the design of approximately 1,080,000 cubic yards of balanced earthwork, three mine seals, rock toe drains, and approximately 3,500 feet of subsurface drains. During remediation, approximately 23,500 feet of ditches were constructed, 13 sediment control ponds with outlet structures were re-constructed, and approximately 830 feet of piping was installed. CEC also managed the revegetation of approximately 165 acres.

Three of the sites have been built successfully. The fourth site is currently under construction.

SHINNS RUN PORTAL

OWNER/CLIENT

West Virginia Department of
Environmental Protection

LOCATION

Shinnston, WV

CEC SERVICES

Site Grading/Earthwork Analysis
Stormwater Management/BMP Design
Hydrogeology and Groundwater Modeling
Groundwater/Surface Water Remediation
Systems
Topographic Surveys
Calculation Brief
Construction Plans and Specifications
Bid Estimate and Engineer's Cost Estimate



OWNER OBJECTIVE

The West Virginia Department of Environmental Protection (WVDEP) was seeking assistance with the reclamation design of the Shinnns Run Portals Abandoned Mine Lands located near Shinnston in Harrison County, West Virginia. Past deep mining operations have captured stream flows, impacted Harrison County Route 13, and resulted in the formation of fifteen open, partially collapsed, or totally collapsed mine openings. The deep mined Pittsburgh coal seam is located in close proximity to several area homes, within the right-of-way of Harrison County Route 13, and within four vertical feet of Shinnns Run Stream.

CEC APPROACH

CEC was awarded the contract to perform engineering services for the reclamation design of the Shinnns Run Portals project. CEC performed field surveying tasks to complement aerial mapping supplied by the WVDEP; developed and implemented a subsurface investigation to quantify and qualify impounded mine pools; and performed a detailed preliminary investigation to include public and private records. The preliminary investigation obtained available deep mine maps, interviewed affected landowners, evaluated construction and drill access, and evaluated sources for materials to be used in reclamation of the project.

The project involved submittal and approval of an Army Corps of Engineers permit and a Hydraulic Engineering Center-River Analysis System (HEC-RAS) hydrologic evaluation of Shinnns Run to determine potential flood impacts to residents' homes from installation of low water crossings in order to successfully seal all mine openings. CEC developed plans to seal two streambeds now flowing into the abandoned mine works through subsidence features. In addition, CEC led boring and jacking operations to place a pipe beneath Harrison County Route 13 and provide hydraulic relief to an area home. Approximately 900 linear feet of ditches, 1,000 linear feet of subsurface drains, 450 linear feet of stream bank protection, and 75 feet of roadbed protection were designed by CEC.

CEC performed topographic surveying; generated construction mapping; analyzed soil test results to determine soil amendments for vigorous vegetative growth; performed hydraulic and hydrologic studies and designed ditches and pipes; developed preliminary and final design construction plans and specifications; designed mine pool dewatering operations and mine drainage treatment plans; developed an engineer's cost estimate, bid schedule, and calculation brief; attended initial on-site, preliminary design, and final design meetings.



McALPIN PORTALS

OWNER/CLIENT

West Virginia Department of Environmental Protection

LOCATION

Bridgeport, WV

CEC SERVICES

- Geotechnical Engineering
- Site Grading/Earthwork Analysis
- Slope Stability/Retaining Structure Design
- Stormwater Management/BMP Design
- Hydrogeology and Groundwater Modeling
- Soil/Groundwater Remediation Systems
- Topographic Surveys
- Calculation Brief
- Construction Plans and Specifications
- Bid Estimate and Engineer's Cost Estimate
- Landslide Remediation

OWNER OBJECTIVE

The McAlpin Portals Abandoned Mine Lands, located near Bridgeport in Harrison County, West Virginia, consisted of approximately 3,400 linear feet of high wall ranging from 30 to 50 feet in height, and ten collapsed mine entries, five of which were discharging acid mine drainage. The uncontrolled mine drainage runs over the hill causing further slope instability and threatening five homes located downhill.

CEC APPROACH

CEC was awarded a contract by the West Virginia Department of Environmental Protection (WVDEP) to perform engineering services for the reclamation design of the abandoned mine lands. CEC designed and implemented a drilling program to define slip limits and testing of spoil properties for slope stability. CEC also supplemented WVDEP mapping with field surveys of important project features such as seep, slip, coal refuse boundaries, and collapsed portal locations.

CEC provided Retaining Wall/Earth Moving Design Alternatives for four slips; reclamation design with 42,000 cubic yards of excavation; 9,200 linear feet of erosion and sediment control; 5,325 linear feet of ditches; 247 linear feet of pipes; 1,317 linear feet of subsurface drains; one manhole; a Gabion Basket Retaining Wall; subsidence hole mitigation; stream bank protection; five mine seals; 23 acres of revegetation; topographic surveying to supplement existing mapping; soil physical properties testing for slope stability; hydraulic studies and design for ditches and pipes; sediment control design; revegetation plan; preliminary and final design; construction plans and specifications; dewatering and AMD Treatment Plan.

This project is currently in the final review/approval stage with the WVDEP and will be let for bid in 2018.





MARYTOWN STREAM MITIGATION BANK

OWNER/CLIENT

Ecosystem Investment Partners, LLC

LOCATION

McDowell County, WV

CEC SERVICES

Stream & Wetland Delineation

Stream Assessment and Valuation Metric
Computation

Geomorphic Assessment

Natural Channel Design

Mitigation Prospectus, Banking Instrument,
Plan, and Permit

Construction Drawings and Specifications

Construction Oversight

DATES OF SERVICE

2013 to Present

ENGINEERING FEES

\$953K

CONSTRUCTION FEES

\$4.5M

CONTACT

Mr. Nick Dilks

Ecosystem Investment Partners, LLC

5550 Newbury Street, Suite B

Baltimore, MD 21209

443-921-9441

OWNER OBJECTIVE

The Marytown Stream Mitigation Bank is one of West Virginia's largest stream mitigation banks, spanning 4,508 acres with a little over 28 miles of streams. This stream mitigation bank was developed by Ecosystem Investment Partners, LLC (EIP) in partnership with Canaan Valley Institute (CVI) and CEC. The Marytown Stream Mitigation Bank provides credits for unavoidable impacts in the Upper Guyandotte, Twelvepole, Big Sandy, Upper New, and Tug Fork watersheds of West Virginia's McDowell and Logan Counties.

The restoration objectives of this mitigation bank are to reconnect, reestablish, and enhance ephemeral, intermittent, and perennial streams disturbed and disconnected by mine benches, road crossings, logging, and pipeline infrastructure. Some project challenges included the reclamation of abandoned mine lands and the restoration of headwater streams with bankfull slopes reaching 70 percent.

CEC APPROACH

CEC was retained to provide ecological planning, assessment, stream design, and permitting services. CEC performed the stream and wetland delineations and conducted a jurisdictional determination site visit with the Interagency Review Team (IRT). CEC also performed water quality, benthic macroinvertebrate sampling and habitat scoring of streams to determine baseline conditions for credit computations using the WV Stream and Wetland Valuation Metric. Geomorphic survey data was collected for stream restoration reaches to determine appropriate natural channel design approaches for restoration. CEC prepared construction-level design drawings for the mitigation plans with its custom stream design application using AutoCAD® Civil 3D® software, which enables rapid design adjustments to stream grading plans. CEC also assisted EIP and CVI in preparing the prospectus, MBI, and mitigation plans and with agency negotiations for the Clean Water Act 404 and 401 permits.

The project team developed innovative mitigation credit options for re-forested, steeply sloped sites and presented the options to the USACE and IRT. The IRT is currently considering these options as a model for mitigation projects on other similar sites. The project was completed in 2016 and all mitigation credits have been released to date.

**Appendix E -
Certificates of Authorization**

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*

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

C02231-00

Engineer in Responsible Charge: STEVEN A. CAIN - WV PE 015264

*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, 2020 - December 31, 2021

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

WEST VIRGINIA BOARD OF PROFESSIONAL SURVEYORS



Certificate of Authorization



Civil & Environmental Consultants, Inc.

Pittsburgh, Pennsylvania

CERTIFICATE OF AUTHORIZATION # 20-5615

This certificate is issued by the West Virginia Board of Professional Surveyors in accordance with *W.Va. Code §30-13A-20*.
The person or organization identified on this certificate is licensed to conduct professional surveying and mapping services
in the State of West Virginia for the period

January 1, 2020 through December 31, 2020

This certificate is not transferrable and must be displayed at the office location for which issued.

In witness whereof, I have put my hand, this 31st day of December 2019

2020



Handwritten signature of Sefton R. Stewart.

Sefton R. Stewart, P.S., Chairman

Lantz G. Rankin, P.S., Member

Handwritten signature of James T. Rayburn.

James T. Rayburn, P.S., Secretary


Gary D. Facemyer, P.E, P.S., Member

Douglas C. McElwee, *Esq.*, Public Member


Appendix F -

Addendum Acknowledgment Form, Disclosure of Interested Parties to Contracts, Purchasing Affidavit, Vendor Preference Certificate

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.

GREGORY S. LINDER, PRINCIPAL
 (Name, Title)
 PRINCIPAL
 (Printed Name and Title)
600 MARKETPLACE AVE, SUITE 200, BRIDGEPORT, WV 26330
 (Address)
304-933-3119 / 304-933-3327
 (Phone Number) / (Fax Number)
glinder@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 & ENVIRONMENTAL CONSULTANTS, INC
 (Company)
 PRINCIPAL
 (Authorized Signature) (Representative Name, Title)
GREGORY S. LINDER, PRINCIPAL
 (Printed Name and Title of Authorized Representative)
9-8-2020
 (Date)
304-933-3119 / 304-933-3327
 (Phone Number) (Fax Number)

**ADDITIONAL TERMS AND CONDITIONS
(Architectural and Engineering Contracts Only)**

1. PLAN AND DRAWING DISTRIBUTION: All plans and drawings must be completed and available for distribution at least five business days prior to a scheduled pre-bid meeting for the construction or other work related to the plans and drawings.

2. PROJECT ADDENDA REQUIREMENTS: The Architect/Engineer and/or Agency shall be required to abide by the following schedule in issuing construction project addenda. The Architect/Engineer shall prepare any addendum materials for which it is responsible, and a list of all vendors that have obtained drawings and specifications for the project. The Architect/Engineer shall then send a copy of the addendum materials and the list of vendors to the State Agency for which the contract is issued to allow the Agency to make any necessary modifications. The addendum and list shall then be forwarded to the Purchasing Division buyer by the Agency. The Purchasing Division buyer shall send the addendum to all interested vendors and, if necessary, extend the bid opening date. Any addendum should be received by the Purchasing Division at least fourteen (14) days prior to the bid opening date.

3. PRE-BID MEETING RESPONSIBILITIES: The Architect/Engineer shall be available to attend any pre-bid meeting for the construction or other work resulting from the plans, drawings, or specifications prepared by the Architect/Engineer.

4. AIA DOCUMENTS: All construction contracts that will be completed in conjunction with architectural services procured under Chapter 5G of the West Virginia Code will be governed by the attached AIA documents, as amended by the Supplementary Conditions for the State of West Virginia, in addition to the terms and conditions contained herein. The terms and conditions of this document shall prevail over anything contained in the AIA Documents or the Supplementary Conditions.

5. GREEN BUILDINGS MINIMUM ENERGY STANDARDS: In accordance with West Virginia Code § 22-29-4, all new building construction projects of public agencies that have not entered the schematic design phase prior to July 1, 2012, or any building construction project receiving state grant funds and appropriations, including public schools, that have not entered the schematic design phase prior to July 1, 2012, shall be designed and constructed complying with the ICC International Energy Conservation Code, adopted by the State Fire Commission, and the ANSI/ASHRAE/IESNA Standard 90.1-2007: Provided, That if any construction project has a commitment of federal funds to pay for a portion of such project, this provision shall only apply to the extent such standards are consistent with the federal standards.

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.:

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)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> 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.

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Company



Authorized Signature

9-8-2020

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

West Virginia Ethics Commission



Disclosure of Interested Parties to Contracts

Pursuant to *W. Va. Code* § 6D-1-2, a state agency may not enter into a contract, or a series of related contracts, that has/have an actual or estimated value of \$1 million or more until the business entity submits to the contracting state agency a Disclosure of Interested Parties to the applicable contract. In addition, the business entity awarded a contract is obligated to submit a supplemental Disclosure of Interested Parties reflecting any new or differing interested parties to the contract within 30 days following the completion or termination of the applicable contract.

For purposes of complying with these requirements, the following definitions apply:

"Business entity" means any entity recognized by law through which business is conducted, including a sole proprietorship, partnership or corporation, but does not include publicly traded companies listed on a national or international stock exchange.

"Interested party" or *"Interested parties"* means:

- (1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors;
- (2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract. (This subdivision does not apply to a publicly traded company); and
- (3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency. (This subdivision does not apply to persons or business entities performing legal services related to the negotiation or drafting of the applicable contract.)

"State agency" means a board, commission, office, department or other agency in the executive, judicial or legislative branch of state government, including publicly funded institutions of higher education: Provided, that for purposes of *W. Va. Code* § 6D-1-2, the West Virginia Investment Management Board shall not be deemed a state agency nor subject to the requirements of that provision.

The contracting business entity must complete this form and submit it to the contracting state agency prior to contract award and to complete another form within 30 days of contract completion or termination.

This form was created by the State of West Virginia Ethics Commission, 210 Brooks Street, Suite 300, Charleston, WV 25301-1804. Telephone: (304)558-0664; fax: (304)558-2169; e-mail: ethics@wv.gov; website: www.ethics.wv.gov.

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 exceeds five percent of the total contract amount.

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

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Authorized Signature: [Signature] Date: 9-8-2020

State of West Virginia

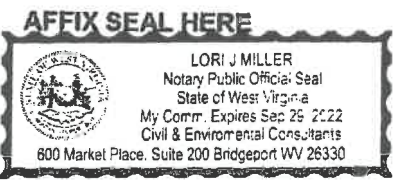
County of Harrison, to-wit:

Taken, subscribed, and sworn to before me this 9 day of September, 2020

My Commission expires September 29, 2022

NOTARY PUBLIC [Signature]

Purchasing Affidavit (Revised 01/19/2018)



West Virginia Ethics Commission Disclosure of Interested Parties to Contracts

(Required by W. Va. Code § 6D-1-2)

Name of Contracting Business Entity: CIVIL ENVIRONMENTAL CONSULTANTS, INC. Address: 600 MARKETPLACE AVE, SUITE 200 BRIDGEPORT, WV 26330

Name of Authorized Agent: GABRIEL S. LINDER Address: SAME AS ABOVE

Contract Number: CE01 0313 DEP210000002 Contract Description: CEMENTION REFUSE REHABILITATION PROJECT

Governmental agency awarding contract: WUDEP

Check here if this is a Supplemental Disclosure

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below (attach additional pages if necessary):

1. Subcontractors or other entities performing work or service under the Contract

Check here if none, otherwise list entity/individual names below.

NGE, LLC - JOHN NOTTINGHAM (DRILLING)
TRIAD ENGINEERING - DANNY BLAKE (LABORATORY)

2. Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)

Check here if none, otherwise list entity/individual names below.

3. Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)

Check here if none, otherwise list entity/individual names below.

Signature: [Signature] Date Signed: 9-8-2020

Notary Verification

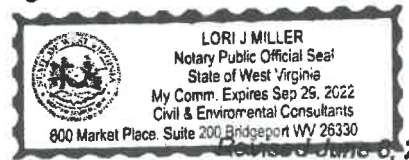
State of West Virginia, County of Harrison:

I, Lori Miller, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 9 day of September, 2020

[Signature]
Notary Public's Signature

To be completed by State Agency:
Date Received by State Agency: _____
Date submitted to Ethics Commission: _____
Governmental agency submitting Disclosure: _____



**Appendix G -
Schedule of Terms and Conditions**

EXPRESSION OF INTEREST
Sardis (Saas) Landslide

SECTION FIVE: TERMS AND CONDITIONS

Terms and conditions begin on the next page.

GENERAL TERMS AND CONDITIONS:

- 1. CONTRACTUAL AGREEMENT:** Issuance of a Award Document signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.
- 2. DEFINITIONS:** As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.
 - 2.1. "Agency" or "Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.
 - 2.2. "Bid" or "Proposal"** means the vendors submitted response to this solicitation.
 - 2.3. "Contract"** means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.
 - 2.4. "Director"** means the Director of the West Virginia Department of Administration, Purchasing Division.
 - 2.5. "Purchasing Division"** means the West Virginia Department of Administration, Purchasing Division.
 - 2.6. "Award Document"** means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the contract holder.
 - 2.7. "Solicitation"** means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.
 - 2.8. "State"** means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.
 - 2.9. "Vendor" or "Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. CONTRACT TERM; RENEWAL; EXTENSION: The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

Term Contract

Initial Contract Term: **Initial Contract Term:** This Contract becomes effective on _____ and extends for a period of _____ year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal should be delivered to the Agency and then submitted to the Purchasing Division thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Unless otherwise specified below, renewal of this Contract is limited to _____ successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed the total number of months available in all renewal years combined. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

Alternate Renewal Term – This contract may be renewed for _____ successive _____ year periods or shorter periods provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

Delivery Order Limitations: In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

Fixed Period Contract: This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within One thousand ninety five (1,095) calendar days.

Fixed Period Contract with Renewals: This Contract becomes effective upon Vendor's receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within _____ days. Upon completion of the work covered by the preceding sentence, the vendor agrees that maintenance, monitoring, or warranty services will be provided for _____ year(s) thereafter.

One Time Purchase: The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

Other: See attached.

4. NOTICE TO PROCEED: Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Award Document will be considered notice to proceed.

5. QUANTITIES: The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

Open End Contract: Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

Service: The scope of the service to be provided will be more clearly defined in the specifications included herewith.

Combined Service and Goods: The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

One Time Purchase: This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

6. EMERGENCY PURCHASES: The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute a breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.

7. REQUIRED DOCUMENTS: All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.

BID BOND (Construction Only): Pursuant to the requirements contained in W. Va. Code § 5-22-1(c), All Vendors submitting a bid on a construction project shall furnish a valid bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

PERFORMANCE BOND: The apparent successful Vendor shall provide a performance bond in the amount of 100% of the contract. The performance bond must be received by the Purchasing Division prior to Contract award.

LABOR/MATERIAL PAYMENT BOND: The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under \$100,000. Personal or business checks are not acceptable. Notwithstanding the foregoing, West Virginia Code § 5-22-1 (d) mandates that a vendor provide a performance and labor/material payment bond for construction projects. Accordingly, substitutions for the performance and labor/material payment bonds for construction projects is not permitted.

MAINTENANCE BOND: The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

LICENSE(S) / CERTIFICATIONS / PERMITS: In addition to anything required under the Section of the General Terms and Conditions entitled Licensing, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits upon request and in a form acceptable to the State. The request may be prior to or after contract award at the State's sole discretion.

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications regardless of whether or not that requirement is listed above.

8. INSURANCE: The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below and must include the State as an additional insured on each policy prior to Contract award. The insurance coverages identified below must be maintained throughout the life of this contract. Thirty (30) days prior to the expiration of the insurance policies, Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. Vendor must also provide Agency with immediate notice of any changes in its insurance policies, including but not limited to, policy cancelation, policy reduction, or change in insurers. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed in this section.

Vendor must maintain:

Commercial General Liability Insurance in at least an amount of: \$1,000,000.00 per occurrence.

Automobile Liability Insurance in at least an amount of: \$1,000,000.00 per occurrence.

Professional/Malpractice/Errors and Omission Insurance in at least an amount of: \$1,000,000.00 per occurrence. Notwithstanding the forgoing, Vendor's are not required to list the State as an additional insured for this type of policy.

Commercial Crime and Third Party Fidelity Insurance in an amount of: _____ per occurrence.

Cyber Liability Insurance in an amount of: _____ per occurrence.

Builders Risk Insurance in an amount equal to 100% of the amount of the Contract.

Pollution Insurance in an amount of: _____ per occurrence.

Aircraft Liability in an amount of: _____ per occurrence.

Notwithstanding anything contained in this section to the contrary, the Director of the Purchasing Division reserves the right to waive the requirement that the State be named as an additional insured on one or more of the Vendor's insurance policies if the Director finds that doing so is in the State's best interest.

9. WORKERS' COMPENSATION INSURANCE: The apparent successful Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

10. [Reserved]

11. LIQUIDATED DAMAGES: This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy. Vendor shall pay liquidated damages in the amount specified below or as described in the specifications:

_____ for _____

Liquidated Damages Contained in the Specifications

12. ACCEPTANCE: Vendor's signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

13. PRICING: The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification. Notwithstanding the foregoing, Vendor must extend any publicly advertised sale price to the State and invoice at the lower of the contract price or the publicly advertised sale price.

14. PAYMENT IN ARREARS: Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears.

15. PAYMENT METHODS: Vendor must accept payment by electronic funds transfer and P-Card. (The State of West Virginia's Purchasing Card program, administered under contract by a banking institution, processes payment for goods and services through state designated credit cards.)

16. TAXES: The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

17. ADDITIONAL FEES: Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor's bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

18. FUNDING: This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

19. CANCELLATION: The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may also cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-5.2.b.

20. TIME: Time is of the essence with regard to all matters of time and performance in this Contract.

21. APPLICABLE LAW: This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

22. COMPLIANCE WITH LAWS: Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to comply with all applicable laws, regulations, and ordinances. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

23. ARBITRATION: Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

- 24. MODIFICATIONS:** This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any change to existing contracts that adds work or changes contract cost, and were not included in the original contract, must be approved by the Purchasing Division and the Attorney General's Office (as to form) prior to the implementation of the change or commencement of work affected by the change.
- 25. WAIVER:** The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.
- 26. SUBSEQUENT FORMS:** The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.
- 27. ASSIGNMENT:** Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments.
- 28. WARRANTY:** The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.
- 29. STATE EMPLOYEES:** State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.
- 30. PRIVACY, SECURITY, AND CONFIDENTIALITY:** The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/default.html>.

31. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

32. LICENSING: In accordance with West Virginia Code of State Rules § 148-1-6.1.e, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to be licensed, in good standing, and up-to-date on all state and local obligations as described in this section. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

33. ANTITRUST: In submitting a bid to, signing a contract with, or accepting a Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

34. VENDOR CERTIFICATIONS: By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein.

Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

35. VENDOR RELATIONSHIP: The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing.

Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

36. INDEMNIFICATION: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

37. PURCHASING AFFIDAVIT: In accordance with West Virginia Code §§ 5A-3-10a and 5-22-1(i), the State is prohibited from awarding a contract to any bidder that owes a debt to the State or a political subdivision of the State, Vendors are required to sign, notarize, and submit the Purchasing Affidavit to the Purchasing Division affirming under oath that it is not in default on any monetary obligation owed to the state or a political subdivision of the state.

38. ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE: This Contract may be utilized by other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts ("Other Government Entities"), provided that both the Other Government Entity and the Vendor agree. Any extension of this Contract to the aforementioned Other Government Entities must be on the same prices, terms, and conditions as those offered and agreed to in this Contract, provided that such extension is in compliance with the applicable laws, rules, and ordinances of the Other Government Entity. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.

39. CONFLICT OF INTEREST: Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

40. REPORTS: Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.requisitions@wv.gov.

41. BACKGROUND CHECK: In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision. The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Revised 01/09/2020

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

42. PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS: Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

- a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.
- b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more of such operations, from steel made by the open heath, basic oxygen, electric furnace, Bessemer or other steel making process. The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:
- c. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars (\$2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or
- d. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

43. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL: In Accordance with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars (\$50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a

“substantial labor surplus area”, as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products. This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

44. INTERESTED PARTY SUPPLEMENTAL DISCLOSURE: W. Va. Code § 6D-1-2 requires that for contracts with an actual or estimated value of at least \$1 million, the vendor must submit to the Agency a supplemental disclosure of interested parties reflecting any new or differing interested parties to the contract, which were not included in the original pre-award interested party disclosure, within 30 days following the completion or termination of the contract. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. This requirement does not apply to publicly traded companies listed on a national or international stock exchange. A more detailed definition of interested parties can be obtained from the form referenced above.

45. PROHIBITION AGAINST USED OR REFURBISHED: Unless expressly permitted in the solicitation published by the State, Vendor must provide new, unused commodities, and is prohibited from supplying used or refurbished commodities, in fulfilling its responsibilities under this Contract.



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