



RECEIVED

2020 SEP 10 AM 10:29

WV PURCHASING
DIVISION

September 9, 2020

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

Re: EOI Kempton Refuse Rehabilitation Project CEOI 0313 DEP2100000002

Dear Mr. Nisbet,

Please find enclosed Tetra Tech's Expression of Interest (EOI) for the Kempton Refuse Rehabilitation Project CEOI DEP 0313 2100000002.

Tetra Tech is very familiar with the Kempton area, and have completed a project for Maryland Department of the Environment adjacent to your current project within the last year. Additionally, Greg Hynes, a principal on our engineering team, had designed the refuse site when he was with a former employer.

If you should have any questions or concerns please contact me at farley.wood@tetrattech.com or via phone at (304)650-2804

Sincerely,

A handwritten signature in blue ink, appearing to read 'Farley R. Wood'.

Farley R. Wood, P.E.
Project Manager

FRW
Enclosures

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

PROJECT NAME Kempton Refuse Rehabilitation Project		DATE (DAY, MONTH, YEAR) 10 September 2020	FEIN 95-4148514
1. FIRM NAME Tetra Tech, Inc		2. HOME OFFICE BUSINESS ADDRESS 320 Adams St Fairmont, WV 26554	3. FORMER FIRM NAME
4. HOME OFFICE TELEPHONE 304-534-4021	5. ESTABLISHED (YEAR) 1966	6. TYPE OWNERSHIP Corporation	6a. WV REGISTERED DBE (Disadvantaged Business Enterprise) NO
7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE Pittsburgh, 661 Andersen Dr, Pittsburgh, PA 15220/412-921-7090/Mark Speranza, PE/ 116 People			
8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM Mr. Mark Perry, PE - Unit President		8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS Mr. Farley Wood, PE - Project Manager - 304-350-2804	

9. PERSONNEL BY DISCIPLINE

— ADMINISTRATIVE 2012	— ECOLOGISTS 152	— LANDSCAPE ARCHITECTS 19	— STRUCTURAL ENGINEERS 98
— ARCHITECTS 130	— ECONOMISTS 138	— MECHANICAL ENGINEERS 70	— SURVEYORS 60
— BIOLOGIST 300	— ELECTRICAL ENGINEERS 60	— MINING ENGINEERS 70	— TRAFFIC ENGINEERS
— CADD OPERATORS 170	— ENVIRONMENTALISTS 746	— PHOTOGRAMMETRISTS 12	— OTHER 13,714
— CHEMICAL ENGINEERS 304	— ESTIMATORS 271	— PLANNERS: URBAN/REGIONAL 96	
— CIVIL ENGINEERS 588	— GEOLOGISTS 367	— SANITARY ENGINEERS 70	
— CONSTRUCTION INSPECTORS 61	— HISTORIANS 3	— SOILS ENGINEERS 34	— TOTAL PERSONNEL 20,000
— DESIGNERS	— HYDROLOGISTS 115	— SPECIFICATION WRITERS 140	Personnel Company Wide
— DRAFTSMEN 200			

TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: 5

*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

11. OUTSIDE KEY CONSULTANTS/SUB-CONSULTANTS ANTICIPATED TO BE USED. Attach "AML Consultant Qualification Questionnaire".

NAME AND ADDRESS: Shallenberger Construction, Inc 195 Enterprise Lane Connellsville, PA 15425	SPECIALTY: Geotechnical Drilling	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
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
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

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

YES Description and Number of Projects: Tetra Tech has extensive experience with AML/Mine Reclamation Engineering. Tetra Tech is currently working on several AML projects in several states. Tetra Tech has also worked on AML related projects within the state of West Virginia. In the last 5 years Tetra Tech has performed 20+ of these types of projects.

B. Is your firm experienced in Soil Analysis?

YES Description and Number of Projects: Tetra Tech has a whole team dedicated to Geotechnical investigations including soil analysis. In the last 5 year this team has performed 20+ projects specifically associated with Soil Analysis.

C. Is your firm experienced in hydrology and hydraulics?

YES Description and Number of Projects: Tetra Tech has performed several project looking at hydrology and hydraulics, specifically Tetra Tech specializes in mine pool analysis and AMD treatment systems. In the last 5 years Tetra Tech has performed 20+ projects looking at hydrology and hydraulics.

D. Does your firm produce its own Aerial Photography and Develop Contour Mapping?

YES Description and Number of Projects: Tetra Tech does produce its own Aerial Photography with the use of drone technology and we use that photography to develop contour mapping. We use this service across all disciplines and industries with hundreds of flights and maps developed on a yearly basis.

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: Tetra Tech's large size and extensive resources provides for skilled individuals in various disciplines, Tetra Tech does have experience in domestic waterline design in conjunction with other projects. Tetra Tech also has on staff PhD hydrologist Eric Perry who retired from Office of Surface Mining where his responsibility was hydraulic monitoring of mine pools and effects of mining on aquifers.

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

YES Description and Number of Projects: Tetra Tech has a whole team dedicated to Acid Mine Drainage projects, we are currently working on 5 projects specifically looking at AMD treatment with 10+ projects completed in the last 5 years.

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.) Gray, Thomas A. PE	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 46	YEARS OF AML RELATED DESIGN EXPERIENCE:46	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

Brief Explanation of Responsibilities
Mr. Gray has more than 40 years of professional experience. He is a technical expert in mining engineering, mine reclamation, coal ash disposal and utilization, watershed and ecosystem restoration, mine subsidence, acid mine drainage remediation, mine stabilization via grouting and abandoned mine fire mitigation. Mr. Gray specializes in active and abandoned mining projects and with infrastructure projects that have mining related concerns. His project management responsibility has included construction, engineering, regulatory compliance, and research and development. He has been responsible for the successful completion of many unique projects.

EDUCATION (Degree, Year, Specialization)
BS, 1973 Mining Engineering/MS 1977 MBA

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS SME	REGISTRATION (Type, Year, State) PE in WV (1988), PA (1978), OH (2009), MD (1989), VA (1980)
--	--

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.) Wood, Farley R.	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 35	YEARS OF AML RELATED DESIGN EXPERIENCE:35	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

Brief Explanation of Responsibilities
Farley Wood has over 35 years of diverse experience in the mining industry. His experience includes engineering, operations, project management, environmental and safety compliance, permitting, regulatory compliance, construction management, and capital projects.

EDUCATION (Degree, Year, Specialization)
BS, 1984 Mining Engineer

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS SME	REGISTRATION (Type, Year, State) PE in WV (1998), PA (1993), OH (1998)
--	--

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Hynes, Greg	25	25	33

Brief Explanation of Responsibilities
 Mr. Hynes has 33 years of professional engineering experience including utility pipelines and abandoned mine land reclamation. Additionally, he has designed and permitted numerous mine surface facilities, oil and gas well pad sites, potable water distribution systems, stormwater conveyance systems, sanitary sewerage systems, and developed E&S control plans.

EDUCATION (Degree, Year, Specialization)
 BS Civil Engineering 1987, MS Civil Engineering 1997

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State) PE - WV (1997), OH (1997), PA (1993)
---	---

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Matthew Ridgway	7	7	3

Brief Explanation of Responsibilities
 Mr. Ridgway is a Civil Engineer with more than 6 years of engineering experience, including managing the design and construction of complex construction projects. His professional focus has been on geotechnical engineering and his expertise includes preliminary site investigation, design, and construction oversight.

EDUCATION (Degree, Year, Specialization)
 BS Civil engineering & BS Mining Engineering 2013

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS ASCE, SME, ASHE	REGISTRATION (Type, Year, State) PE - WV (2019), PA (2019), VA (2019), MD (2019), CO (2019), WY (2019)
--	--

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

Microsoft Office Professional and Microsoft Project

Bentley Pond Pack (Haestad methods)

Adobe Photoshop

Adobe Acrobat

AutoCAD Map 3D

AutoDesk Civil 3D

ESRI ArcGIS

ESRI ArcView

Bentley Flow Master (Haested Methods)

Bentley HEC-Pack

STBL5M

Groundwater Vistas

GMS

Autodesk Storm and Sanitary Analysis

Hydro CAD

SLIDE STABILITY ANALYSIS PROGRAM

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
Kempton Sludge Disposal Line Garrett County MD	Maryland Department of the Environment 160 S Water Street Frostburg, MD 21532	Prime Contractor	\$385,000	100%
Wingfield Pines Inflow Reconstruction Project, Upper St. Clair Township, Allegheny County PA	Allegheny Land Trust 416 Thorn Street Sewickley, PA 15143	Prime Contractor	\$1 Million	100%
Gladden AMD Treatment Plant, South Fayette Township, Allegheny County PA	South Fayette Conservation Group 515 Millers Run Road Morgan, PA 15064	Prime Contractor	12\$ Million	60%
WVDEP OSR Royal Coal Bond Forfeiture Fayette County WV	WVDEP OSR 1159 Nick Rahall Greenway Fayetteville, WV 25840	Prime Contractor	\$250,000	100%
Glenn Springs Holdings Bird Mine Treatment, Tire Hill Pennsylvania	Glenn Springs Holdings 5 Greenway Plaza, Suite 10 Houston, TX 77046	Prime Contractor	Confidential	Ongoing
Quakake Treatment Plant Carbon County Pennsylvania	PADEP BAMR 2 Public Square 5 th Floor Wilkes-Barre, Pennsylvania 18701	Prime Contractor	\$1.2 Million	60%
Blacklick Creek Treatment Facility	PADEP BAMR 400 Market Street Harrisburg, PA 17106	Prime Contractor	\$160,000	75%
TOTAL NUMBER OF PROJECTS: Tetra Tech is currently conducting thousands or projects nationwide for the purpose of the EOA only a sample is provided			TOTAL ESTIMATED CONSTRUCTION COSTS: \$+15 Million	

17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
WV Land Stewardship Larosa Fuels Marion County WV	WV Land Stewardship Corporation 709 Beechurst Ave Morgantown, WV 26505	\$136,000	2018	Yes
Dolph Underground Mine Fire, Lackawanna County, PA	PADEP BAMR 400 Market Street Harrisburg, PA 17106	\$15 Million	2018	Yes
Scenic Rail Road Subsidence Evaluation Garrett County Maryland	Maryland Department of the Environment 160 S Water Street Frostburg, MD 21532	\$114,000	2017	Yes
Pipeline Slip Investigation Belmont County Ohio	Confidential Client	Confidential	2017 & 2018	Yes
Frush Enterprises Bond Forfeiture Harrison County WV	WVDEP OSR 1159 Nick Rahall Greenway Fayetteville, WV 25840	\$152,000	2017	Yes
Buffalo Coal Mt. Storm, WV	WV Land Stewardship Corporation 709 Beechurst Ave Morgantown, WV 26505	\$269,170	2018	Yes
Rasuch Creek Treatment Plant Upgrades Schuylkill County PA	PADEP BAMR 2 Public Square 5 th Floor Wilkes-Barre, Pennsylvania 18701	\$200,000	2018	Yes
Tetra Tech had conducted thousands of projects nationwide for the purpose of the EOA only a sample is provided				


18. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM HAS BEEN A SUB-CONSULTANT TO OTHER FIRMS (INDICATE PHASE OF WORK FOR WHICH YOUR FIRM WAS RESPONSIBLE)

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

19. 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.

Tetra Tech has extensive knowledge and vast resources to allow for a comprehensive approach to any problem. Tetra Tech works extensively with Abandoned Mine Lands and is well versed on solutions to any problem. Tetra tech has a strong presence in West Virginia in Fairmont and Charleston, with offices in Pittsburgh, PA and St. Clairsville, OH regularly performing work in the state. The Tetra Tech Pittsburgh office has worked with WVDEP on several Special Reclamation projects throughout the state.

20. The foregoing is a statement of facts.

Signature: 

Printed Name: Farley R. Wood

Title: Project Manager

Date: 9-9-2020

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/Nitigation/Replace ment	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	Tom Gray, PE	Farley Wood, PE	Greg Hynes, PE	Matthew Ridgeway	Other Project Team Personnel
Wingfield Pines Intowl Reconstruction	C&P	Yes				X				X	X	X	X				M	P			P	P
WVDEP OSR Roayl Coal Bond Forfeiture	C&P	Yes	x							x					X		M	P			P	P
Kempton Sludge Disposal Line	C&P	Yes											X				M	P			P	P
MDE Scenic Rail Road Subsidence Evaluation	C&P	Yes							X						X		M	P			P	P
PADEP Black Lick Creek	C&P	Yes											X				M				P	P
PADEP Dolph Mine Fire	C&P	Yes						X									M				P	P
PADEP Rausch Creek	C&P	Yes											X	X			M	P			P	P
WVDEP OSR Frush Enterprises Bond Forfeiture	C&P	Yes	X												X		M	P			P	P
WVLSL Larosa Fuels	C&P	Yes	X											X			M		P		P	P
Gladden AMD Treatment Plant	C&P	Yes									X	X	X				M	P			P	P
Glenn Springs Holdins Bird Mine Treatment	C&P	NO								X	X	X	X				M		P		P	P
Quakake Treatment Plant	C&P	NO									X		X				M				P	P
WVLSL Buffalo Coal	C&P	No	X														M		P		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 "B"



EXPERIENCE SUMMARY

Mr. Gray has more than 40 years of professional experience. He is a technical expert in mining engineering, mine reclamation, coal ash, mineral appraisals, rare earth elements associated with coal, watershed and ecosystem restoration, mine subsidence, acid mine drainage remediation, and abandoned mine fire mitigation. Mr. Gray specializes in active and abandoned mining projects and with infrastructure projects that have mining related concerns. His project management responsibility has included construction, engineering, regulatory compliance, and research and development.

RELEVANT EXPERIENCE

Senior Program Manager; US Department of Energy / National Energy Technology Laboratory; Rare Earth Elements Associated with Coal and Coal By-Products; Northern and Central Appalachia Basin. Managed project to identify and quantify the existence high levels of rare earth elements in coal seams and associated geology in the Northern and Central Appalachia.

Senior Program Manager; US Department of Energy / National Energy Technology Laboratory; Rare Earth Elements Associated with Coal and Coal By-Products; Rocky Mountain Basin. Managed project to identify and quantify the existence high levels of rare earth elements in coal seams and associated geology in the Rocky Mountains.

Senior Program Manager and Principle Investigator; US Department of Energy / National Energy Technology Laboratory; Assessment of Rare Earth Elemental Contents in Select US Coal Basins. Managed project investigating the association of coal and rare earth elements by looking at the geophysical makeup of coal basins, determining the geologic relationships that may exist between rare earth element occurrences in various coal basins, cataloging instances of elevated rare earth elements and identifying likely sources of rare earth elements in the US coal basins.

Senior Program Manager and Principal Investigator; US Department of Energy / National Energy Technology Laboratory; Study on the Utilization of Portable Hand-Held XRF Spectroscopy as a Screening Tool for Rare Earth Elements in Coal and Coal Waste Products. Managed project investigating the effectiveness of applying X-Ray Fluorescence (XRF) spectrometer analysis as a field screening method to evaluate coal and coal waste products for Rare Earth Elements..

EDUCATION

BS, Mining Engineering,
Pennsylvania State University,
1973

MBA, University of Pittsburgh,
1977

AREA OF EXPERTISE

Mining Engineering

**REGISTRATIONS/
AFFILIATIONS**

Professional Engineer, WV,
1988, [REDACTED]

Professional Engineer, PA,
1978, [REDACTED]

Professional Engineer, MD,
1989, [REDACTED]

Professional Engineer, VA,
1980, [REDACTED]

Professional Engineer, OH,
2009, [REDACTED]

YEARS OF EXPERIENCE

40

Project/Contract Manager; Professional Design Services Contract; Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation; PA. Currently managing this open-end contract to provide professional design services to remediate problems such as acid mine drainage, contamination of water supplies, degraded stream quality, subsidence, and abandoned refuse and waste piles, strip mines, highwalls, and landslide-prone areas.

Senior Project Manager; Open-End Contract; Maryland Department of the Environment Bureau of Mines; Frostburg, MD. Managed an open-end contract to provide technical assistance in mine engineering, acid mine drainage treatment and mine reclamation. Completed 16 projects, including evaluating the use of solar or wind power to operate a mine water treatment plant.

Project Manager; Open-End Hydrogeology/Mining Contract; Maryland Department of the Environment Bureau of Mines; Frostburg, MD. Managed an open end contract that provided hydrogeology services to the state agency.

Plans for Reclamation of Abandoned Mine Lands

Senior Project Manager; Abandoned Coal Mine Pool Wastewater Overflow Elimination; Township of Upper St. Clair in conjunction with PADEP, Three Rivers Wet Weather Development Corporation, EPA, and Heinz Foundation; Upper St. Clair, PA. Investigated feasibility of eliminating wastewater overflows by diverting the flow into a pumped down abandoned underground coal mine pool as a temporary storage reservoir. After weather event subsides the overflow would be pumped out of the mine to a treatment facility. The project addressed not only the pollution from the sewer overflow but also the pollution from the mine drainage as both would be treated together. The DOE's National Energy Technology Laboratory and the University of Pittsburgh assisted with the project by researching the combined treatment of alkaline sewage and acidic mine water.

Project Manager; Coal Combustion Byproduct Based Grout Project; WVDEP; Monongalia County, WV. This R&D project injected coal combustion byproduct based grout into 25 acres of abandoned mine workings to reduce the generation of AMD and to reduce subsidence potential. Responsible for research and development investigation, construction plans and specifications, monitoring construction, and preparing a research report. Project sponsors included Allegheny Energy, DOE, Consol, and the Electric Power Research Institute.

Project Manager; OSM Little River Mining Reclamation Project; Cloudland, GA. The Office of Surface Mining Little River Reclamation project near Cloudland, Georgia, required regrading an abandoned coal mine strip pit to eliminate a highwall, construction of drainage channels, and revegetation of disturbed areas. The survey was conducted to prepare site topography and cross sections at 50-foot intervals for reclamation and restoration of approximately 2,500 feet of abandoned highwall (as high as 100 feet) from surface mining. A grading plan was prepared that included site drainage features for two drainage channels.

Closure of Mine Openings

Senior Project Consultant; Mine Seal Research; NIOSH; Fayette County, PA. Research project to evaluate a potentially significant improvement to current state-of-the-art practice of constructing mine seals through vertical boreholes when direct access is prohibited. The new technology was tested and proved to be effective in providing barriers to airflow and to impound water and other inert materials.

Project Manager; Fisher Run and Tunnelton Mine Portal Closures; WVDEP Office of AML and Reclamation; Lewis and Preston Counties, WV. Project Manager for the preparation of construction drawings to install wet mine seals and drainage improvements for the closure of abandoned mine portals on private property in Weston and Tunnelton, WV. Prepared construction specifications and construction cost estimate for the closure of nine mine portals.

Project Manager; Mine Seal Designs; Ohio Valley Coal Company; Aledonia, OH. Prepared mine seal designs for three shafts for use at an active coal mine during mine closure. The mine seals were designed to withstand the expected water pressure after the maximum mine pool has developed.

Project Manager; Mine Seal Evaluation; Duquesne Light Company; Greensboro, PA. Evaluated suitability of a mine seal at the Gray's Landing Lock and Dam being constructed on the Monongahela River by the USACE.

Control and Extinguishment of Subsurface Mine Fires

Senior Project Manager; Dolph Mine Fire; PA DEP – Bureau of Abandoned Mine Reclamation. Responsible for the design of a complete extinguishment plan for the mine fire near Scranton, Pennsylvania. The actual mine fire is on two coal seams and associated coal refuse embankment.

Senior Engineer; Colorado Statewide Mine Fire Abatement Contract; Colorado Division of Reclamation, Mining and Safety; CO. The Colorado Inactive Mine Reclamation Program (CIMRP) is charged with abating, to the extent possible, hazards associated with mining activities resulting from mining which occurred prior to August, 1977. Six underground coal mine fires were identified for funding for reclamation design for their abatement and Tetra Tech was retained for this work. Mr. Gray is serving as a lead engineer supporting this work, which includes project development, design, procurement documents, and field management of fire abatement activities. Projects begin with the development of a mine fire abatement strategy and then the development of an abatement design. An Invitation for Bid is then created to find a suitable contractor and Tetra Tech then provides construction management and inspection services.

Project Manager; Abandoned Coal Mine Fire Remediation Plan; Confidential Client; PA. During the development of a well pad, a natural gas drilling client operating in the Marcellus Shale experienced elevated temperatures in excavated materials due to a burning abandoned coal mine. Tetra Tech investigated the subsurface conditions and Mr. Gray managed a Mine Fire Remediation Plan for the client.

Senior Project Manager; Dolph Mine Fire; Office of Surface Mining; Lackawanna County, PA. The Dolph mine fire was burning in coal refuse and two underground abandoned anthracite coal mines. A site investigation was completed to define the limits of fire and to recommend fire control methods. A cut-off trench was selected, plans and specifications were prepared and a contractor was selected. Construction was successfully completed and the fire is under control.

Project Consultant; Percy Mine Fire Control Project; PADER; Fayette County, PA. Provided consultation for this mine fire control project that involved mine grouting to contain an underground mine fire. The fire was successfully controlled.

Senior Project Manager; Cohen Mine Fire; Office of Surface Mining; OSM; Baldwin Borough, PA. Provided surveying and consultation for this small underground abandoned coal mine fire.

Senior Project Manager; Maiolie Mine Fire; Office of Surface Mining; Washington Township, PA. Provided surveying and consultation for this small underground abandoned coal mine fire.

Senior Project Manager; Coal Mine Fire Abatement; Office of Surface Mining; Elk County, PA. Managed the surveying during the abatement of a 1.5 acre coal mine fire. Quantity surveys were initiated within 24 hours of request by OSM.

Project Advisor; World Bank Mine Fire Appraisal; Dhanbad, State of Bihar, India. Assisted in the mine fire appraisal project to assess the fires in 17 coal seams of the 450 sq. km. coalfield for the world's largest complex of above-ground and underground mine fires.

Project Manager; Coal Refuse Pile Reclamation; Maple Coal Company; Colver, PA. Prepared technical specifications for reducing the potential for spontaneous heating at the Colver coal refuse pile.

Abatement or Treatment of Drainage and Acid Mine Drainage Water Pollution

Project Engineer; Parker Run Mine Drainage Design; West Virginia Department of Environmental Protection Office of AML&R; Marion County, WV. Supporting this contract, which includes design of drainage conveyances, design installation of mine seals, highwall reclamation, design of refuse reclamation, design of stream bank stabilization, design of structural and trash removal/disposal, and re-vegetation of disturbed areas.

Project Manager; Blacklick Creek Vinton/Wehrum Mine Drainage Treatment Facility Design; PADEP Bureau of Abandoned Mine Reclamation; Indiana County, PA. Tetra Tech was retained by PADEP for the design of a mine drainage treatment facility. Managing this large, multifaceted project included the design of a mine water conveyance system, design of relief boreholes, assessment of local mines for sludge disposal, coal refuse pile analysis, mine shaft and subsidence assessment, historical and museum commission documentation/clearance, conceptual treatment facility layout, public involvement through the development of a website, and the development of bid documents.

Project Manager; Palo Alto Mine Drainage Study and Design; PADEP Bureau of Abandoned Mine Reclamation; Borough of Palo Alto, PA. Managing this mine drainage study. Mine drainage is appearing at a residence in the Borough of Palo Alto during heavy precipitation events. Previous attempts at remediation by PADEP and the Office of Surface Mining were unsuccessful. Tetra Tech will conduct study the site then provide preliminary and final designs. The project will also include drilling, water testing, and surveying.

Project Advisor; East Avoca Mine Drainage Study; PADEP Bureau of Abandoned Mine Reclamation; Avoca Borough, PA. Providing oversight for this mine drainage study in Avoca, PA. Several residents along Grove Street in Avoca have reported incidents of mine water in basements and in their yards during heavy precipitation events. Tetra Tech's investigation will determine the location and depth of abandoned mine workings that may be the source of mine water occasionally noted along Grove Street. Tetra Tech will then propose alternative solutions to abate the drainage problem.

Senior Project Manager; Alkaline Coal Ash Injection to Mitigate Acid Mine Drainage; CTC Foundation in conjunction with PADEP BAMR and Others; Washington, DC. Evaluated the injection of alkaline coal ash into the 537-acre Valley No. 2 mine to mitigate an AMD (500 gpm) pollution to the Conemaugh River and nearby Big Spring Run. Provided technical consultation for the investigation and authored a technical report. The project team included PADEP, Bureau of Abandoned Mine Reclamation, the Kiski-Conemaugh Coalition, Blacklick Creek Watershed Association, Reliant Energy, the Western PA Watershed Protection Project, St. Clair Township, and PA DCNR.

Senior Project Manager; Acid Rock Seepage Mitigation; University of Pittsburgh in Conjunction with PADOH; Snowshoe, PA. A research project was conducted to determine the cause of and the potential mitigation solutions to an acid rock seepage condition in a rock filled highway embankment. It was determined that infiltration percolating through the embankment was becoming acidic when contacting pyrite rich sandstone. The now acidic water further contacted the underlying clays and developed high concentrations of aluminum. The seepage, estimated to average 25 gpm, severely polluted Jonathan Run. Mitigation schemes were evaluated and treatment was selected. A preliminary design of a sodium hydroxide treatment system was prepared.

Senior Project Manager; Passive Treatment Techniques for Acid Mine Discharges; MAX Environmental Services; Yukon, PA. Developed plans to use passive treatment techniques to treat most of the effluent from a hazardous waste disposal facility. Water sources included near neutral surface water runoff, acidic mine discharges and alkaline underflows from disposal cells.

Senior Project Manager; South Branch Blacklick Creek Acid Mine Drainage Feasibility Study; USACE Pittsburgh District; Nanty Glo, PA. Completed a feasibility study to determine the most effective passive abatement method for treating acid mine drainage at the abandoned mine and restoring the aquatic environment of the South Branch Blacklick Creek. Project manager for the conceptual design and cost estimate. A general evaluation report for the restoration of the aquatic ecosystem was completed.

Senior Project Manager; Mine Pool Acid Discharge Investigation; LTV Corporation; Greene County, PA. Conducted an investigation of the potential to utilize biological remediation for a large mine pool acid discharge. Responsible for evaluating and developing a field test to utilize sulfate reduction bacteria to mitigate the large Clyde Mine Pool discharge.

Senior Project Manager; Thompson Run Watershed Acid Mine Drainage Assessment and Restoration; Municipality of Monroeville; Monroeville, PA. Prepared a watershed restoration project for Thompson Run, a tributary of Turtle Creek. Responsible for assessing the adverse impacts of acid mine drainage on the 16-square-mile watershed and developing a realistic restoration plan.

Project Manager; Acid Mine Drainage Identification / Mine Pool Water Sourcing Study; Confidential Client; Forest City, PA. Identified large acid mine drainage sources around Forest City to be used as potential sources of water for a Marcellus Shale client's fracing operations in northeast PA. Mr. Gray gathered the historic flow and chemistry data for the discharges. Two discharges were singled out for further consideration, Vandling and Grey Slope. The mine pools were georeferenced onto a map with these discharges. A conceptual passive treatment system was designed for the Vandling Discharge with an associated pipeline to transport the water to a truck loading area.

Project Manager; Casselman Mine Acid Mine Drainage Prevention and Response Plan; Maryland Energy Resources; Garrett County, MD. Prepared a plan for submittal to the state of Maryland which outlined the measures to be taken to prevent impacts to the Casselman River by mine water when an underground coal mine was closed. The plan needed to include provisions that explained the interaction of the final mine pool with the Casselman River, what measures would be taken to avoid seeps, outflows, and other discharges resulting from the mine pool, how the mine pool would be controlled post-mining, a monitoring and detection plan for acid mine drainage seeps, and a response/mitigation plan should a seep or discharge occur.

Project Manager; Kempton Mine Acid Mine Drainage Study; Mettiki Coal Company; Western MD. Completed a mine drainage study to determine the feasibility of eliminating AMD flowing from the abandoned Kempton mine into the headwaters of the Potomac River by siphoning water from the pool into an adjacent active underground mine. The study evaluated the potential for lowering the mine pool to below the level of the discharge by siphoning water from the pool into Mettiki's active underground mine.

Evaluation and/or Rehabilitation of Existing Passive or Active AMD Treatment Systems

Project Engineer; AMD Treatment; PADEP; Cresson, PA. Supporting this preliminary design evaluation associated with the proposed Cresson AMD Treatment Plant. BAMR has entered into an agreement with the Susquehanna River Basin Commission to provide treated AMD to supplement flow during low flow periods. Project is currently in the field investigation phase to identify the location of the proposed facility and mine water extraction wells.

Project Manager: Bear Run Acid Mine Drainage Passive Treatment System; Indiana County Conservation District in Conjunction with PADEP; Indiana County, PA. Project Manager for the design of a passive AMD mine treatment system, site grading and PADEP / Indiana County Erosion and Sediment Control permit, stream restoration and preparation of a PADEP Government Financed Construction Contract for a third party contractor to remove coal refuse from the site. Prepared construction grading plans, permits and hydraulic analysis of the Bear Run stream for a stream culvert crossing.

Project Manager: Group Gladden Mine Acid Mine Drainage Treatment System; South Fayette Conservation; South Fayette Township, PA. Preparation of a site grading plan and passive AMD treatment system to treat a maximum flow rate of 1,500 gpm of AMD flow from the abandoned Gladden Mine into Millers Run and Chartiers Creek. Preparation of a grading plan, specifications and design calculations to create 3 acres of passive treatment ponds and design of a spray pumping system to deliver 1,000 gpm of AMD through a nozzle system for aeration and evaluation of stream flow losses in areas affected by past mining.

Project Manager; Acid Mine Drainage Passive Treatment Design; BethEnergy Mines; Ebensburg, PA. Completed a preliminary design of a large passive treatment system to treat acidic mine water from a permitted closed coal mine. Responsible for a conceptual design of the passive treatment system and final design and construction oversight of a pilot test treatment system.

Senior Project Manager; Pilot Passive Acid Mine Drainage Treatment System; Glenn Springs Holding, Inc. (subsidiary to Occidental Petroleum); Tire Hill, PA. Designed a pilot passive treatment system including an anoxic limestone drain, sedimentation ponds, and wetlands to treat acid mine water from an underground coal mine. Performed construction monitoring and prepared as-built drawings.

Senior Project Manager; Jandy Coal Refuse Acid Mine Drainage Investigation and Design; Paint Creek Watershed Association in Association with PADEP; Windber, PA. Investigated acid mine drainage on the Jandy coal refuse disposal site. It was determined that the source of the contamination was a reclaimed surface mine spoil and adjacent abandoned deep coal mine. The selected mitigation approach was to reduce the surface infiltration through drainage controls and to reduce the level of the mine pool so that the groundwater levels would be reduced and thus eliminate the discharge. Design plans were prepared as part of this project.

Project Consultant; Owings Mine Complex Site Reclamation Acid Mine Drainage Treatment System Design; WVDEP; Charleston, WV. Reclamation design of an abandoned mine site comprising old mine structures, open mine portals, refuse piles and numerous acid mine drainage producing discharges. Evaluated water quality and designed a passive AMD treatment system design at the Owings Mine Complex site. **Awarded: James E. "Pete" Pitsenbarger AML Award North, West Virginia Reclamation Awards.**

Water Line Extension/Water Line Replacement

Project Manager; Pump and Overland Pipeline System; Duquesne Light Company; Greene County, PA. Designed approximately two miles of a pump and overland pipeline system and provided designs and specifications for a half mile overland pipeline, including a bridge crossing.

Project Advisor; Gauley River and Heizer/Manilla Creek Water Line Extensions; WVDEP; Nicholas County, WV. Evaluated construction documents for the Gauley River and Heizer/Manilla Creek water line extension projects.

Project Manager; Water Pipeline and Pump Station; Cambria Township Water Authority in conjunction with Inter-Power/AIcon Partners; Colver, PA. Designed and provided construction inspection for a 2.5-mile water pipeline and pump station project. The system provides up to 1600 gpm of water for the Municipality of Cambria Township and for the Colver Power Plant. The Colver Plant is a 110 mw water-cooled facility.

Surface Mine Reclamation

Project Manager; Surface Mining Act; Maryland Department of the Environment Bureau of Mines; Frostburg, MD. Managed an open end contract that provided hydrogeology services to the state agency. Investigated and provided expert opinions of the impacts on two domestic water supply sources from surface mining in Raynor and Kinsinger, MD. Reported on the impacts of surface coal mining activities on the quality and quantity of local groundwater supplies in the vicinity of Mill Run, MD. Reviewed the groundwater hydrology section of a surface coal mine permit application during agency review.

Project Manager; Coal Ash Disposal Guidelines for Surface Mines; Maryland Department of Natural Resources; MD. Prepared guidelines for the disposal of coal ash in surface mines.

Mine Subsidence Control

Project Manager; Mine Subsidence Investigation; Virginia Department of Mines, Minerals, and Energy (VA DMME); Wise County, VA. Mr. Gray led an investigation to characterize suspected mine voids on two

residential properties which exhibited evidence consistent with mine subsidence. Mr. Gray retained and coordinated with two subcontractors to aid in completing the work – a land surveyor and a driller. Work consisted of a property survey, a ground penetrating radar (GPR) survey, and generation of mapping and a drilling investigation plan. Mr. Gray completed the drilling investigation plan by selecting locations to drill based on physical observations and the results of the GPR survey. Drilling operations included downhole camera services by the Federal Office of Surface Mining (OSM). After the drilling was completed, a report was drafted including recommendations for addressing the subsidence features.

Project Manager; Natural Gas Pipeline Subsidence Study; MarkWest Energy; Southwest PA. MarkWest Energy approached Tetra Tech to perform a preliminary subsidence study to determine the level of subsidence risk along two proposed natural gas pipeline alignments in southwest PA. The appropriate mine maps of the mines which were located beneath the proposed alignments. The proposed alignments and mine maps were georeferenced onto a USGS map. The level of cover was identified and the existing and planned mine workings by mining method and approximate extraction ratio were classified. This information was used to predict the relative presence/risk of past, present, and future subsidence. A high risk of future subsidence under one of the alignments was identified.

Senior Project Manager; Longwall Mining Subsidence; Consol Energy; Greene County, PA. Evaluated longwall mining subsidence and impacts to surface structures.

Project Manager; Streyer Run Mine Subsidence Impacts Assessment; Maryland Department of the Environment Bureau of Mines; Garrett County, MD. Assessed potential mine subsidence impacts on Streyer Run from proposed underground mining.

Project Engineer; Preliminary Subsidence Assessment; Capels Resources (Subsidiary to Berwind Corporation); McDowell County, WV. Preliminary subsidence assessment project for underground coal mining property being proposed as a sanitary landfill.

Senior Project Manager; Subsidence Evaluation; Duke Energy; Edwardsport, IN. Evaluated subsidence potential at an undermined site selected as a new power plant location. The mining under this site was approximately 50 feet deep and had been abandoned for over 50 years. Plans and specifications were prepared for grouting 20 acres of the site with a fly ash/cement mixture. Testing was performed to verify the suitability of the grout mix. Available onsite ash was investigated and determined to be acceptable. Construction monitoring was also performed.

Project Manager; West Elk Mine; Mountain Coal Company, LLC; Somerset, CO. Completed subsidence evaluation and report for ten longwall panels extending into the Dry Fork lease in Gunnison County, CO. Potential impacts to Deep Creek Ditch were evaluated.

Water Supply Replacement

Project Advisor; Water Supply Extension Project; WVDEP; Logan County, WV. Prepared construction documents for a water supply extension project.

Project Advisor; Mill Creek-Isom Water Supply System Design; WVDEP; Chapmanville, Logan County, WV. Designed a water supply system to service approximately 800 residents of the Mill Creek-Isom Community along Godby Branch watershed.

Project Manager; Geotechnical and Hydrologic Investigation to Provide Municipal Water Supply; Inter-Power/AlCon Partners; Colver, PA. Conducted a geotechnical and hydrologic investigation for a 53'-high embankment dam to provide a municipal water supply and cooling water for a cogeneration power plant. Completed an environmental assessment, including wetland delineation, wetland mitigation design and cultural resources investigations. Provided design, cost estimating, permitting and construction monitoring services for the Dam and Reservoir.

Other Mining Related Projects

Project Manager: Fishing Run Stream Sealing; South Fayette Conservation Group (SFCG) in Association with PADEP; South Fayette Township, PA. Installation of five (5) weirs and continuous flow meters to monitor the stream flow conditions, analysis of flow data, stream corridor land surveying, geophysical surveying to identify subsurface cracks and flow patterns, stream base study to identify stream sections which flow directly over fractured bedrock, stream sealing design alternatives analysis, and the stream encroachment permit pre-application meeting.

Project Manager; Alternative Fuel Supply and Ash Disposal Evaluation; Suez Energy Generation North America – Northeastern Power Company (NEPCO); McAdoo, PA. Identified all permitted and non-permitted fuel (anthracite culm) supply and ash disposal sites within a 30 mile radius of the NEPCO power plant. 42 permitted sites and 16 non-permitted sites were identified as alternative options to NEPCO's current fuel supply and ash disposal sites. After discussions with NEPCO and the site operators and owners, the list was narrowed down to seven permitted and two unpermitted sites. A final report was prepared that provided final recommendations for future operations

Project Manager; Gladden Mine Pool Water Sourcing Study; Range Resources South Fayette Township, PA. Range Resources was seeking a source of water for their fracing operations near South Fayette Township. Tetra Tech analyzed the feasibility of pumping and treating water from the Gladden Mine Pool at a rate sufficient to lower the mine pool enough cut off the Gladden discharge and restore Miller's Run.

Senior Project Manager; Kempton Mine Water Treatment Facility; MD Department of the Environment Bureau of Mines; Frostburg, MD. The Kempton mine water treatment facility was designed to use electricity generated by a diesel engine due to its remote location. Alternative sources of electricity were investigated, including solar, wind and a new transmission line.

Senior Project Manager; Chartiers Creek/Fishing Run Mine Discharge Investigation; South Fayette Conservation Group in Association with PADEP; South Fayette Township, PA. During an investigation of the deep mine discharges in Chartiers Creek it was found that Fishing Run was being diverted into a deep mine entrance and after becoming polluted coming out at the Gladden discharge, the largest pollution source in the watershed. Through a grant from PADEP a reclamation design was prepared and permitted. The design included sealing the mine entrance, reclaiming abandoned highwalls, removing dangerous mine structures and restoring 2000 feet of stream channel. Construction monitoring was performed.

Senior Project Manager; Chartiers Creek Mine Discharge Assessment; Chartiers Nature Conservancy in Association with PADEP; Crafton, PA. Assessed the characteristics of the large deep mine discharges in the Chartiers Creek main stem. Flow and chemical data was collected for nine mine discharges over a 12 month period. Mine maps were obtained and scanned into a GIS database. The conceptual hydrology of the

mines was evaluated, including underground drainage basins and pooled conditions. This information was used to develop a restoration plan for the watershed.

Senior Project Manager; Watershed Restoration Plan; Cambria County Conservation and Recreation Authority; Ebensburg, PA. Prepared a watershed restoration plan to restore the headwaters of the Little Conemaugh River. Various treatment alternatives were evaluated and the most economical and technically feasible approach was recommended.

Senior Project Manager; Geotechnical Investigation for Monongahela Properties; Office of Surface Mining; Washington County, PA. Managed a geotechnical investigation to provide an opinion on the source of ground movements that damaged four properties in the town of Monongahela. Responsible for conducting exploratory drilling and preparing a report of findings for four residential properties and the intervening roadway that had been affected by ground disturbance.

Senior Project Manager; Water Well Investigation; Office of Surface Mining; Indiana County, PA. Evaluated water wells to address complaints of methane gas venting from old wells. Provided an opinion of the source of gas being vented from the wells.

Project Consultant; River Conservation Plan; Kiski-Conemaugh River Basin Alliance; Johnstown, PA. A river conservation plan for the 1,800 sq. mile Kiski-Conemaugh River Basin comprising five major watersheds was prepared. The River Basin Conservation Plan resulted in a comprehensive plan aimed at remediation the river basin. The plan was prepared in accordance with the guide lines of the PA DCNR Rivers Conservation Program.

Project Manager; Mine Water Migration; New Warwick Mining Company; Greene County, PA. Evaluated potential for mine water to migrate through geologic strata between two mines in different coal seams. Estimated when the filling mine pool in the recently abandoned Shannopin deep mine would flow into the overlying active mine through the mine floor.

Project Engineer; Underground Coal Mining Complex Evaluation and Water Treatment Plant Design; Inter-Power of New York; Colver, PA. Completed a potential environmental liabilities assessment of a large property. Provided a water treatment plant preliminary design and associated cost estimates. Evaluated potential environmental liabilities associated with the purchase of an inactive underground coal mining complex and associated runoff and leachate collection ponds, including mine, surface water, and refuse pile leachate and runoff collection and treatment, and ecological and ground-water impacts. Cost estimates for post-closure, including water treatment were also prepared.

Mining Engineer; Robena Coal Mine Water Pumping System Design; U.S. Steel Corporation; Greene County, PA. Planned and designed the mine water pumping system at the Robena Coal Mine using 19 pumps within the mine, several miles of pipeline, and discharging approximately two million gallons per day.

Project Manager; Mining Complex Water Balance Study; Confidential Client; Belmont County, OH. Work consisted of identifying all water uses and discharge points for a mining complex containing two longwall mines, a proposed third longwall mine, two prep plants, a proposed third prep plant, a slurry impoundment, and multiple surface sedimentation ponds. The goal of the project was to conceptually design a freshwater impoundment in an adjacent valley to control the current and anticipated water uses. Drainage and stream flow data from the previous five years were modeled with the needs of the mining complex to

determine the required capacity of the impoundment to allow ample storage for dry months while conforming to TDS discharge requirements. Multiple dam scenarios were modeled utilizing Carlson to minimize the surface disturbance and stream impacts while achieving the desired fresh water storage volume in the impoundment.

Project Manager; Galbraith Landslide Abatement/Geotechnical Investigation; Office of Subsurface Mining; Allegany County, MD. Conducted a geotechnical investigation to gather the required site information to design landslide abatement measures for a 140-ft. wide landslide uphill from the Galbraith residence in Barton, MD. The investigation involved drilling, testing, and surveying to characterize the site, and design abatement measures to stabilize the landslide.

Project Manager; Coal Refuse Pile Slope Stabilization; Office of Surface Mining; Allegany County, MD. Prepared an abatement plan for stabilizing the slope of a coal refuse pile (Sand Spring gob pile) adjacent to a small stream. The refuse pile was eroded by the stream during Hurricane Ivan and left a near vertical, unstable slope. The abatement plan consisted of a combination of regrading and vegetative ("soft armoring") and riprap stabilization. Hydrologic and hydraulic analyses were also provided.

Senior Project Manager; Mine Shaft Investigation; Office of Surface Mining; Auburn, MI. Project Manager responsible for investigating and determining the location of 13 mine shafts, varying in depth from 100 feet to 250 feet. The shafts were subsequently stabilized using compaction grouting under a separate project.

Project Engineer; Quecreek Mine Expansion Permit; Quecreek Mine; PA. Managed the development of a mine expansion permit for submittal to PADEP. The project also included water quality and hydrogeologic analysis, pillar stability analysis, and a geologic analysis.

Project Manager; Hunlock Power Station; UGI Corporation; PA. Responsible for design and permitting to expand the ash disposal site at the station.

Project Manager; Johnsonville Power Station; Tennessee Valley Authority; Johnsonville, TN. Developed an ash management plan. Grading plans, separating ash disposal areas into different cells, were completed.

Project Manager; Coal Disposal Site Reclamation; Costain Coal Corporation; KY. Prepared a plan to utilize a coal ash/soil mixture in lieu of using all soil to reclaim a coal disposal site at a much lower cost than the permitted plan. This plan was approved by the State of Kentucky and successfully implemented.

Project Manager; North Branch Mine; Island Creek Corporation; WV. Mine planning, cost estimating, and permitting services for the mining of coal waste and the disposal of AFBC ash at the North Branch Mine, including exploration and geotechnical evaluation. The site was planned to be mined in a manner such that non-fuel material and coal ash could be placed behind mining in a way that the site would be returned to a stable condition.

Project Engineer; BethEnergy Mines Mine Feasibility Study; Nicholas County, WV. Conducted a feasibility study of a four million ton per year mountain-top removal project. The mine was permitted and operated successfully.

Project Manager; Surface Mine Permits; Addington, Inc.; Kanawha County, WV. The 1000+-acre surface mine was graded so that stable side slopes would be created. The erosion controls were designed as long ponds that would blend into the graded hills at completion of reclamation.

Project Engineer; DOE Mine Ventilation Evaluation/Design; Carlsbad, NM. Provided mine ventilation evaluation and design and managed a shaft grouting project to reduce water infiltration into a nuclear waste disposal facility, a constructed salt mine approximately 2000 feet deep.

Project Manager; Wardrop; Peer Review of Yongding Shangzhai Coal Mine Due Diligence Study; Fujian Province, China. Reviewed and provided technical comments on the reserve estimate, mining, and risk assessment portions of a due diligence report prepared by Wardrop for an existing long wall coal mine in China.

Project Manager; PBS Coals, Inc.; Due Diligence Study of a Potential Acquisition; Somerset County, PA. Verified coal reserves and investigated environmental liabilities of two separate coal companies (35 separate sites) for potential acquisitions.

Project Manager; US Steel Corporation Abandoned Mine Shaft Reopening; Washington County, PA. Developed a plan to re-open an abandoned shaft in an adjacent mine for ventilation purposes in an active coal mine.

Project Manager; Island Creek Coal (subsidiary to Occidental Petroleum) Structural Integrity Investigation; Grant and Tucker Counties, WV. Structural integrity investigation project for a 125-foot-high, 500 kV steel lattice transmission tower immediately above chain pillars separating two longwall panels of a 300 feet deep mine. Responsible for evaluations, including structural analysis and prediction of the impacts of active longwall mining on the electrical transmission tower.

Project Manager; Greene County Development Authority Mine Feasibility Investigation; Waynesburg, PA. Completed a feasibility investigation and financial evaluation for the potential purchase of an existing mine by forming an employee stock ownership plan by the mine's employees.

Mining Engineer; U.S. Steel Corporation Dilworth Mine and Maple Creek Mine Construction Oversight; Western PA. Provided construction oversight for construction of a new shaft at the Dilworth mine and a new bathhouse at the Maple Creek mine.

Project Engineer; ANR Coal Company Mine Permitting and Construction Management; Wise County, VA. Complete permitting, site construction design, contractor selection, and construction management for a one million ton per year coal mine facility and coal waste disposal site in Virginia.

Project Engineer; ANR Coal Company Mine Feasibility Study and Economic Evaluation; Webster County, WV. Completed a feasibility study and economic evaluation for a one million ton per year West Virginia mine complex. Provided permitting services, prepared construction plans and specifications and provided onsite construction management.

CHRONOLOGICAL WORK HISTORY:

Tetra Tech, Inc., Pittsburgh, PA, Group Manager – Energy, and Natural Resources, 2007 to present. Responsible for projects associated with energy and natural resources.

GAI Consultants, Inc., Monroeville and Homestead, PA, Business Development Director and Senior Project Manager, 1997- 2007. Managed ecosystem restoration, mine drainage remediation, mine grouting, CO2 credit training and abandoned mine fire mitigation projects.

GAI Consultants, Inc., Charleston, WV, Branch Manager, 1994-1997. Managed mine reclamation, environmental regulatory, air quality permitting, trail designs and natural gas industry projects.

GAI Consultants, Inc., Monroeville, PA, Lead Engineer and Engineering Manager, 1986-1994. Managed mining, municipal waste, ash disposal and utilization and dam design projects.

Dravo Corporation, Pittsburgh, PA, Senior Engineer and Project Engineer, 1978-1986. Managed Engineering Procurement and Construction (EPC) contracts for construction of a \$500 million new steel mill and was operation manager at the Waste Isolation Pilot Plant (a nuclear waste repository).

U.S. Steel Corporation, Uniontown, PA, Management Trainee, Mining Engineer, and Assistant Mine Foreman, 1973-1978. Direct Supervision of an underground coal mine production unit, directed surface and underground construction projects, including ventilation, ground control and mine drainage.

PROFESSIONAL AFFILIATIONS:

Society for Mining, Metallurgy, and Exploration, Inc., (SME)
Past Chairman of Pittsburgh Section
1997 Distinguished Member Award (Pittsburgh Section)
2009 Distinguished Member (National)

PUBLICATIONS:

- 2018 Gray, T.A., "Rare Earth Elements in Coal Resources within the Rocky Mountain Coal Basins", presented at the Rocky Mountain Coal Institute Annual Meeting, Vail, CO, June 24-26, 2018
- 2018 Gray, T.A., "Coal and coal Mine Wastes, a Resource for Rare Earth Elements", presented at 2018 PA Abandoned mine Reclamation Conference, State College, PA, June 21, 2018.
- 2018 Gray, T.A., Wood, F.A., Pugh, K, Moore, J. Richers, D., Andersen, A., Bryan, R., "Identification and Characterization of Coal and Coal By-Products Containing high Rare Earth Element Concentrations", Northern and Central Appalachia, prepared for National Energy Technology Laboratories, DE-FE-0026648.
- 2018 Gray, T.A., Wood, F.A., Pugh, K, Moore, J. Richers, D., Andersen, A., Bryan, R., "Identification and Characterization of Coal and Coal By-Products Containing high Rare Earth Element Concentrations", Rocky Mountain Basin, prepared for National Energy Technology Laboratories, DE-FE-0026929.

- 2018 Gray, T.A., "Rare Earth Elements in Coal", presented at the North American Coalbed Methane Forum, Southpoint, Canonsburg, PA, April 18, 2018
- 2018 Gray, T.A., "Rare Earth Elements in Coal", presented at the SME/Pennsylvania Anthracite Meeting, Reading, PA, March 8, 2018
- 2017 Gray, T.A., "Rare Earth Elements in Coal", presented at the Pittsburgh/Section SME/PCMIA Meeting, Canonsburg, PA, October 2017
- 2016 Gray, T.A., Perry, E. Sasiharan, S., Knott, D., "Geotechnical and Environmental Characteristics of Final Open Cut Coal Mine Voids in the USA with Applicability to Australian Mines", presented at the Mine Rehab Conference April 7, 2016, NSW Australia
- 2015 Gray T.A., Andersen, H.T., Bryan, R., Richers, D., "Rare Earth Occurrences Proximal to the Cretaceous/Tertiary* Boundary in the Raton Basin, South-central Colorado" presented at the AiChE Conference, Salt Lake City, Utah, November 8-13, 2015
- 2015 Gray, T.A., Bryan, R.C., Richers, D., Andersen, H.T., "Assessment of Rare Earth Elemental Contents in Select United States Coal Basins", January 2015
- 2015 Gray, T.A., Andersen, H.T., Bryan, R., Richers, D., "Rare Earth Occurrences in Coal and Their Association with Tonsteins, Diapirs, and Igneous Activity" presented at the 2015 Pittsburgh Coal Conference, October 6, 2015
- 2015 Gray, T.A., Gray R.E., Balaz, W.P., "Update on Mine Closure Sealing and Abandonment Practices" presented at Mine Closure 2015, Vancouver, Canada, June 1-3, 2015
- 2014 Gray T.A., Quinlan, S., Milavec, P., Smth, T., Johnston, C., Tresse, C., "Cresson AMD Abatement Project" presented at SME Annual Meeting Denver CO, February 2014.
- 2011 Gray T., Furniss, M., Gessler, M., Jones, M., McCay, J., Paison, W., Stonebraker, W., Cunningham, D., Coen, D., Knudsen, S., "Cost-Effective Application in the power Generation Market", prepared for National Energy Technology Laboratory, DOE/NELT-2011/1483
- 2010 Gray, T. A., Assessment of Risk, Legal Issues and Insurance for Geologic Carbon Sequestration in Pennsylvania. Presented at Pittsburgh Geologic Society Meeting, September 2010. Pittsburgh, PA.
- 2010 Gray, T. A., "Assessment of Risk, Legal Issues, and Insurance for Geologic Carbon Sequestration in Pennsylvania. Presented at PA BAR Institute – Environmental Law Forum, April 22-23, 2010, Harrisburg, PA.
- 2010 Gray, T.A., "Greenhouse Gas Emission Trading to Mitigate Coal Mne Fires" presented at the Energy Utility Environmental Conference at Tucson, AZ, February 2010.
- 2009 Gray, T. A., Bruhn, R.W., Mack, J.F. (OSM) "Dolph Abandoned Mine Fire Control Project" presented at the 2009 annual SME meeting in Denver, Colorado, February 22-25, 2009.
- 2007 Gray, T.A., "Surface Mining" article for inclusion in McGraw-Hill Encyclopedia of Science and Technology, 10th edition
- 2005 Gray, T.A., and Horrell, S. (PADEP). "Ninevah Acid Mine Pollution Abatement Project" presented at the 2005 World of Coal Ash, Lexington, KY, April 15, 2005.
- 2004 Gray, T.A., Crayne, L.M., Trevits, M.A., Glogowski, P.E. "Demonstration of Remote Mine Seal Construction" presented at the Annual SME Meeting, Denver, Colorado, February 23-25, 2004.
- 2003 Gray, T.A., and Broush, J.C. "Use of GIS in Mining Applications" presented at the Seminar on the Use of GIS in Mining Application at California University, Canonsburg, PA, May 8, 2003.
- 2003 Gray, T.A., and Smith, Ed, USACE, "Ecosystem Restoration - South Branch Blacklick Creek" published in the March-April 2003 issue of The Military Engineer, SAME's monthly magazine.
- 2002 Gray, T.A., Gray, R.E. "Coal Combustion Products Can be Used to Construct Tailing Dams" presented at the 19th Annual International Pittsburgh Coal Conference, Pittsburgh, PA, September 25, 2002.

- 2002 Gray, T.A. and Gray, R.E. "Omega Mine Injection Projects" presented at the PA Conference on Abandoned Mine Reclamation, June 15, 2002, State College, PA.
- 2002 Gray, T.A., Gray, R.E., and Newman, F.B. "Utilization of Coal Combustion By-Products in Tailing Dams" presented at the Tailing Dams 2002 meeting in Las Vegas, NV, May 1, 2002.
- 2000 Gray, T. A., Kyper, T.N., Smith, E., and Hedin, R. "Feasibility Study for Ecosystem Restoration by Remediation of the Webster Mine Discharge at Nanty Glo, Pennsylvania." Presented at the U.S.D.O.E., NETL Facility, Morgantown, WV, October 4, 2000.
- 2000 Gray, T. A., Michalski, S.R., and Parkinson, J.W. "Re-Mining Coal Preparation Plant Slurry Ponds" presented at the Tailing Dams 2000, Association of State Dam Safety Officials Annual Conference, Las Vegas, NV, March 28-30, 2000.
- 1998 Gray, R. E., and Gray, T. A. "Coal Mine Reclamation by Ash Haulback." Presented at the 8th Congress of International Association of Engineering Geology, Vancouver, B.C., September 1998.
- 1998 Gray, T. A., Moran, T. C., Broschart, D., and Smith, G. "Injection of Coal Combustion By-Products into the Omega Mine for the Reduction of Acid Mine Drainage." Presented at the Pittsburgh Coal Conference in Pittsburgh, PA, September 15, 1998.
- 1998 Gray, T. A., Moran, T. C., Broschart, D., and Smith, G. "Injection of Coal Combustion By-Products into the Omega Mine for the Reduction of Acid Mine Drainage." Presented at the 1998 Annual National Meeting of the American Society for Surface Mining and Reclamation (ASSMR), Saint Louis, MO, May 16-21, 1998.
- 1998 Gray, R.E., and Gray, Thomas A. "Coal Combustion Ash Haulback." Presented at the 1998 Annual National Meeting of the American Society for Surface Mining and Reclamation (ASSMR), Saint Louis, MO, May 16-21, 1998.
- 1998 Moran, T. C., Gray, T. A., Smith, G. A., and Broschart, D.W. "Injection of Coal Combustion By-Products into the Omega Mine for the Reduction of Acid Mine Drainage." Presented at the West Virginia Surface Mine Drainage Task Force in Morgantown, WV, April 7-8, 1998.
- 1997 Gray, T. A., Moran, T. C., Broschart, D. W., and Smith, G. A. "The Omega Mine Grout Injection Project." Presented at the International Ash Utilization Symposium, Lexington, KY, October 20-22, 1997.
- 1997 Gray, T. A., Moran, T. C., Broschart, D. W., and Smith, G. A. "Using Coal Combustion By-Products to Reduce Acid Mine Drainage at the Omega Mine." Presented at the 19th Annual National Abandoned Mine Lands Conference at Canaan Valley, WV, August 18-19, 1997.
- 1997 Kyper, T. N., Snodgrass, J., and Gray, T. A. "Disposal of Coal Combustion By-Products in Underground Coal Mines." Published in the University of Kentucky Center for Applied Energy Research bimonthly newsletter, Energeia.
- 1997 Gray, T. A., Moran, T. C., Broschart, D., and Smith, G. "Plan for Injection of Coal Combustion Byproducts into the Omega Mine for the Reduction of Acid Mine Drainage." Presented at the 1997 Annual Meeting of the American Society for Surface Mining and Reclamation, Austin, TX, May 10-16, 1997.
- 1997 Ward, Patrick E., and Gray, T. A. "Environmental Standardization ISO 14000." Presented at the Central Appalachian Section of the Society for Mining, Metallurgy and Exploration, Inc.'s 1997 Annual Spring Meeting, Lexington, KY, April 4, 1997.
- 1997 Gray, T. A. "Coal Ash Utilization at Coal Mines." Presented at the West Virginia Mining and Reclamation Association Meeting, February 14, 1997.
- 1994 Gray, T. A., Perry, M. T., and Conrad, P. W. "Management of Coal Waste Disposal for Reduced Environmental Impacts and for Increased Profits." Presented at the annual meeting of the Society for Mining, Metallurgy, and Exploration, Albuquerque, NM, February 14-17, 1994.

- 1992 Gray, T. A., and Gray, R. E. "Mine Closure, Sealing, and Abandonment." In SME Mining Engineering Handbook, 2nd ed., edited by H. L. Hartman. Society for Mining, Metallurgy, & Exploration, 1992.
- 1991 Gray, T. A., Perry, M. T., and Gray, R. E. "Ash Haulback Alternatives for Coal Mine Operators." Presented at the American Mining Congress Coal Convention, Pittsburgh, PA, June 5, 1991.
- 1991 Gray, T. A., Bruhn, R. W., Luxbacher, G. W., and Ferrell, J. R. "The Structural Response of a Steel Lattice Transmission Tower to Mining-Related Ground Movements." Presented at the 10th International Conference on Ground Control in Mining, Morgantown, WV, June 10-12, 1991.
- 1990 Gray, T. A., and Perry, M. T. "Overview of AFBC Ash Disposal Options for Coal or Coal Waste Burning Power Plants." Presented at the Seventh Annual International Pittsburgh Coal Conference, Pittsburgh, PA, September 10-14, 1990.
- 1986 Gray, T. A. and Sethi, S. "Computer Modeling of Underground Ventilation at WIPP." Presented at the fall meeting of the Society of Mining Engineers of the AIME, St. Louis, MO, September 7, 1986.



FARLEY R. WOOD, P.E.

Senior Project Manager, Operations Manager, Principal Engineer

EXPERIENCE SUMMARY

Farley Wood has over 35 years of diverse experience in the mining industry. His experience includes engineering, operations, project management, environmental and safety compliance, permitting, mergers and acquisitions, and executive level leadership. He is a licensed Professional Engineer in Pennsylvania, West Virginia, and Ohio.

Mr. Wood's expertise encompasses surface mining techniques including truck and shovel, draglines, highwall mining, and dredging systems; along with underground mining techniques encompassing both room and pillar and longwall methods; along with refuse and tailings disposal. His engineering experience covers mine design, cost estimating, long and short-term operational planning, reserve development, exploration, maintenance planning, surface and underground mine planning operations, mine closure, mineral and aggregate processing, coal cleaning/preparation, waste and tailings disposal, stream relocation and restoration, acid mine drainage treatment systems, health and safety, and quality management.

Mr. Wood's regulatory compliance and permitting experience includes mine permitting in seven states, water quality compliance, stormwater, and air quality permitting and compliance. His management experience includes creation of operating budgets and budget management, capital and operating cost estimates, sales, contract negotiation, health and safety program management, and cash management.

RELEVANT EXPERIENCE

Senior Project Manager, South Fayette Conservation Group, Gladden AMD Treatment Plant (2019 - Present)

Design/Build/Operate: Design, permit, build, and operation of a water treatment facility to restore eight miles of impacted stream in Allegheny County Pennsylvania. The \$13 M project will lower an existing discharging mine pool, treat the Acid Mine Drainage utilizing hydrogen peroxide as an oxidizing agent, and pump the precipitated sludge into underground mine working for disposal.

EDUCATION

B. S., Mining Engineering, 1984,
Penn State University

Post-Graduate Master of Business
Admin. Courses, 2004, Bowling
Green State University

TRAINING/CERTIFICATIONS

Professional Engineer, PA
1990, [REDACTED]

Professional Engineer, OH
1993, [REDACTED]

Professional Engineer, WV
1991, [REDACTED]

US Dept. of Interior, Office of Surface
Mining, Appalachian Regional
Reforestation Initiative

Coaching and Leading People –
Pennsylvania State University

Ground Control Safety in
Underground Mining – Pennsylvania
State University

Ground Control in Mining – ICGCM

Pillar Design for Room and Pillar
Mining - MSHA

Mine Drainage Symposium – WV
Mine Drainage Task Force

Metallurgical Coal Evaluation for
Coke Making – Coaltech
Petrographic Associates

OFFICE

St. Clairsville Ohio

YEARS OF EXPERIENCE

36

YEARS WITH TETRA TECH

5

Senior Project Manager, Exelon Power, Peach Bottom Marina Dredging (2018-2019): Performed a feasibility study into dredging operational alternatives to reduce costs. Once option was chosen performed design work, permit modifications, provided bid documents, and bid technical review.

Senior Project Manager, Guernsey Power Plant, Lands Unsuitable for Mining Petition to Ohio DNR (2018): Petitioned on behalf of Guernsey Power Station to designate plant and substation areas unsuitable for mining. The designation was requested and granted to protect the plant from potential future mining impacts and address coal ownership issues.

Senior Project Manager, Alleghany Land Trust, Wingfield Pines Inflow Reconstruction (2018-2019): Managed the project to re-establish acid mine drainage flow to passive treatment system that entailed mine dewatering, bulkhead design and installation, permitting, and creation of new gravity flow water system that would be self-sustaining into the future.

Project Engineer, Sunoco Pipeline, Current and Future Subsidence Threats to Pipeline Construction (2018): Determining the subsidence potential of areas beneath planned horizontal directional drillings of the Mariner East I and II Pipeline through investigation of previous mining and finite element analysis modeling of potential future subsidence impacts to the pipeline.

Principal Investigator, US Dept. of Energy / National Energy Technology Laboratory, Rare Earth Elements Associated with Coal and Coal By-Products (2016 to 2018): Manage federal project to identify and quantify the existence high levels of rare earth elements in coal seam and associated geology in the Northern Appalachia, Central Appalachia, and Rocky Mountain coal basins.

Senior Project Manager, West Virginia DEP, Office of Special Reclamation, Royal Coal Project (2016) Reclamation and Water Treatment: Manage engineering and reclamation design for bond forfeitures site in southern West Virginia. Site consists of coal preparation plant remnants, coarse refuse disposal, tailings disposal, rail siding, and water treatment system design to meet discharge standards.

Senior Project Manager, Ramaco Resources (2016) Due Diligence: Performed an environmental due diligence and permit review on a 76 million ton room and pillar and surface mine reserves called Elk Creek Property in the Dorothy, Williamson, Cedar Grove, Alma, Eagle, #2 Gas, and Ben's Creek seams in Logan County WV. Evaluated environmental liabilities, permit issues and time estimates, and outstanding issues.

Senior Project Manager, PaDEP Rausch Creek Plant Upgrades (2016) Capital Project: Managed upgrade and modernization project for watershed based acid mine drainage treatment facility located in eastern Pennsylvania.

Senior Project Manager, Weirton Area Port Authority (2014 to 2015) Development Project: Managed development of inland river port facility on the upper Ohio River, including facility closures, redesign, infrastructure expansion, river terminal design and permitting, community involvement, and facility re-opening.

Vice President, AK Coal Resources (2011 to 2014) Capital Project: Started and managed new underground mining division for Fortune 500 steel company. Managed \$100 million vertical integration greenfield project from inception through full production. Responsible for reserve development, workforce development, engineering management, operations management, operational profit and loss, lease and contact miner management, coal preparation and tailings disposal.

Vice President, Coal Innovations (2013 to 2014) Plant and Refuse Disposal Expansion: Managed expansion project for low vol metallurgical coal preparation facility that doubled plant capacity and improved fine coal recovery. Responsible for the final design, equipment selection, along with construction and budgetary oversight. Managed expansion of coal tailings disposal site, inclusive of site selection, design, and permitting.

Vice President, AK Coal Resources (2012): M&A Lead: Lead team in evaluation, negotiation, and closure of acquisition of Coal Innovations, a coal processing and refuse disposal operating company in Somerset County, Pennsylvania.

Senior Engineering Manager, AK Coal Resources, (2011 to 2012) Capital Design: Conducted costing, site design and construction of new mining complex. Supervised site development, subcontractors, and construction. Selected and installed mining equipment, material handling systems, along with communication and monitoring systems. Certified operation of stormwater system, mine water treatment system, SPCC plan, and ground control plans.

Director of Environmental Compliance and Permitting, Murray Energy Corp. (2007 to 2011): Managed all operational and environmental permitting, compliance, and associated projects for seven operating units of a national mining corporation. Worked on state and federal levels to insure uninterrupted mining operations, and environmental compliance was maintained.

Sr. Project Manager, Ohio Valley Coal Corp. (2008 to 2011) Capital Design: Management of the Casey Run coal tailings disposal project in Ohio. Responsible for project cost analysis, site selection, impoundment design, surface water management, underdrain design, permitting, agency coordination (state and federal), mitigation, alternatives analysis, biological studies, reclamation planning, and hydrologic modeling of discharge quality.

Sr. Project Manager, Ohio Valley Coal Corp. (2010 to 2011) Waste Disposal: Management of Tailings Dam #2 expansion project. Responsible extending the life of the facility, cost analysis of alternatives, emergency response plan, stability analysis, water balance, property acquisition, permit modifications, construction, testing, and water quality management of a slurry impoundment supporting two longwall mines.

Sr. Project Manager, Murray Energy Corp. (2010 to 2011) SPCC Compliance: Developed SPCC plans for all subsidiary facilities in Ohio, West Virginia, and Pennsylvania. Facilities included underground coal mines, surface coal mines, coal preparation plants, tranloading facilities, waste disposal sites, maintenance and rebuild shops, and water treatment facilities.

Sr. Project Manager, KenAmerican Resources (2009 to 2010) Water Treatment: Led design team, managed installation and operations of Andalex AMD remediation project in Kentucky. Responsible for

design of passive sulfate reducing bioreactor treatment system, approval by state and federal agencies, installation, and operation and monitoring of the system.

Sr. Project Manager, OhioAmerican Energy (2008 to 2009), Reclamation: Managed the FGD Beneficial Use demonstration project with American Electric Power (AEP) in Ohio. Permitted, designed, monitored, and constructed FGD disposal sites using FGD to reclaim highwalls on abandoned mine sites.

Sr. Project Manager, American Coal Company (2010 to 2011) Waste Disposal: Managed tailings disposal permitting in Illinois. Responsible for site selection, impoundment design, permitting, agency coordination (state and federal), mitigation, alternatives analysis, biological studies, and hydrologic modeling of discharge quality.

Sr. Project Manager, AmericanMountaineer Energy (2010 to 2011) Design and Permitting: Design and permitting of a greenfield longwall complex in West Virginia. Responsible for site design, tailings disposal site selection and design, permitting, mitigation, and rail loadout design and construction.

Project Manager, Oxford Mining (2006 to 2008) Permitting and Certification: Responsible for surface mine permitting in multiple states. Designed, constructed and certified all stormwater management systems, and annual reviews and renewals.

Vice President – Operation, MGQ Inc. (2005) Due Diligence: Acquisition of high quality dolomitic limestone reserves. Identified, verified, and acquired reserves for new quarry operations. Performed exploration, reserves evaluation, and financial analysis to determine value of assets.

Vice President - Operations, MGQ Inc. (2001 to 2005): Operational and P&L responsibility for chemical grade ore and aggregate mining and material processing in Ohio. Profitably operated the largest single aggregate producing facility (+4 Mt/yr) in the state of Ohio, serving chemical and aggregate markets by rail and truck.

Vice President - Operations, Rohr Corporation (2000 to 2001): Operational and P&L responsibility for dredging system manufacture. Designed, fabricated, and constructed highly automated custom dredging and material handling and processing systems throughout the US.

Director of Engineering and Mining Operations, Nugent Sand Corp. (1996 to 2000): Engineering, operational, and P&L responsibility for multiple inland and river dredging and material processing facilities in Kentucky and Indiana. Responsibilities included capital projects, mining, processing, and material handling system designs and their operations.

General Manager, Samco Inc. (1994 to 1996): Operational and P&L responsibility for sand and gravel dredging and material processing in northeastern Ohio. Manufactured specialty sand and gravel product on a project specific basis.

Senior Vice President, James Coal Co./Mincorp (1992 to 1994) Due Diligence: Evaluated multiple underground and surface mine reserves in southern West Virginia and eastern Kentucky. Evaluated

remaining reserves, access to future reserves, environmental liabilities, permit issues and time estimates, performed financial analysis.

Senior Vice President, James Coal Co./Mincorp (1992 to 1994): Responsible for P&L for mountain top removal and contour surface mining operations in southern West Virginia. Responsible for mining and reclamation operations, safety and health compliance, mine planning, permitting, reserve acquisition, equipment selection, long and short-term mine plans, financial budgets and forecasts, and workforce development.

Vice President, Engineering, Roxcoal Inc./Mincorp (1990 to 1994) Due Diligence: Evaluated multiple underground and surface metallurgical and steam grade reserves in western Pennsylvania and northern West Virginia. Evaluated remaining reserves, access to future reserves, environmental liabilities, permit issues and time estimates, performed financial analysis.

Vice President, Engineering, Roxcoal Inc./Mincorp (1990 to 1994): Responsible for engineering for underground mining operations including mine planning, permitting, reserve acquisition, equipment selection, long and short-term mine plans, merger and acquisition due diligence, and health and safety.

Sr. Mining Engineer, Adobe Mining / Darmac Coal (1984 to 1990): Responsible for engineering support for surface and underground mining operations, mine plans, and permitting. Led reserve development team comprised of leasing agents, exploratory drilling, and engineering evaluations. Recipient of numerous mine reclamation awards

MEMBERSHIPS

American Institute of Mining, Metallurgical, and Petroleum Engineers
Society of Mining, Metallurgy & Exploration
Holmes Safety Association
NW Ohio Chapter Founder and President
Ohio Valley Oil and Gas Association



Gregory Paul Hynes, PE
Project Manager

EXPERIENCE SUMMARY

Mr. Hynes has 33 years of professional engineering experience including utility pipelines and abandoned mine land reclamation. Additionally he has designed and permitted numerous mine surface facilities, oil and gas well pad sites, potable water distribution systems, stormwater conveyance systems, sanitary sewerage systems, and developed E&S control plans.

His utility pipeline experience began in 1987 when he was employed as district engineer for an Ohio public water utility. His design experience over the last 32 years includes route layout selection and E&S plans for industrial raw water pipelines for Chevron, USS Steel, Foundation Coal, and CONSOL. More recently he has provided E&S design and plan reviews of overland gas pipelines for Sunoco and EQT. He has also designed and managed dozens of potable water distribution projects totaling hundreds of miles in length for projects in overland, rural, suburban, and urban settings.

His mine reclamation experience began in 1991 and includes acting as principal engineer or project manager responsible for design calculations, cost estimates, plans, and technical specifications for over 50 abandoned mine land reclamation project sites in West Virginia, Ohio, Pennsylvania, and Virginia for agencies including WVDEP, ODNR, USCOE, VDMME, and PADEP. Projects included reclamation of steep refuse piles, highwalls, burning refuse, exposed mine entries, abatement of acidic mine drainage, active and passive AMD treatment, and mine subsidence grouting. His responsibilities also included tracking schedules and budgets, project billing, and hiring sub-consultants. Mr. Hynes has also prepared permit applications and construction level drawings and specifications for proposed surface mine facilities in PA, WV, and NC. Projects included permitting and reclamation of various mining facilities such as pipelines, shaft sites, boreholes, preparation plants, pits, refuse storage areas, slurry impoundments, treatment ponds, stream enclosures, sedimentation ponds, E&S controls and numerous minor permit modifications.

CHRONOLOGICAL WORK HISTORY (FULL TIME/40 HRS PER WEEK)

Project Manager, Tetra Tech, Inc., December 2012 – Present, Canfield, Ohio
Project Manager/Senior Engineer, Michael Baker Corp., 1991- 2012, Beaver, PA
Engineer, Widmer Engineering, 1989-1991, Beaver Falls, PA
District Engineer, Ohio Water Service Company, 1987-1989, Struthers, Ohio

EDUCATION

M.S., Civil Engineering, 1997,
Youngstown State University

B.E., Civil Engineering, 1987,
Youngstown State University

Registrations

Professional Engineer,

██████████ PA

██████████ OH

██████████ WV

TRAINING/CERTIFICATIONS

HES GENERAL ORIENTATION

PA DEP ESGP2, 2013

OFFICE

Canfield, OH

YEARS OF EXPERIENCE

32

YEARS WITH TETRA TECH

5

SELECTED RECENT PROJECT EXPERIENCE

Project Manager; Isabella Refuse (2020- Present); Pennsylvania DEP; Fayette County, PA.

Responsible for project management and oversight of engineering design; grading, reclamation, and erosion sediment control plans; specifications; and cost estimates for a large abandoned coal strip mine and reprocessing site near the town of Isabella near the Monongahela River. The project included dewatering plans for permanently reducing water levels of a 100 acre impoundment by over 40 feet, design of permanent spillway outlet structures, grading plans to address unstable refuse piles and fine coal slurry impoundments, site access, surface drainage, and passive treatment of mine seeps. Siphoning plans have been developed to lower impoundment water levels. Detailed plans and specifications are currently being developed for permanent site reclamation. Design of passive treatment systems will be undertaken in the future based on observed impacts to the seeps from lowering the impoundment water levels.

Project Manager; Buffalo Coal Permits (2018- 2020); West Virginia Land Stewardship Corp. for the WVDEP Office of Special Reclamation; Grant County, WV.

Responsible for project management and oversight of engineering design, development of construction and erosion sediment control plans, specifications, quantities and cost estimates. The project included site characterization and development of an active AMD treatment system to meet NPDES discharge limitations of several bond forfeiture sites around the vicinity of the Mount Storm Reservoir. The design includes a selection and design of an AMD collection and pumping system to provide centralized active treatment of discharges from 4 permit sites spread over a 6-mile area. Detailed plans and specifications are currently being developed to include site grading, drainage control, and an active water treatment system.

Senior Engineer/Task Manager; Ohio River Pipe and Diffuser (2019), Buckeye Water District/Dallis Dawson Associates; Wellsville, Ohio.

Responsible for pipeline and diffuser design for an outfall for a proposed power facility. Design included layout of ductile iron ball and socket river pipe and fittings as needed to connect to the proposed shore pipe and extend to the terminal diffuser consisting of a flanges ductile iron pipe section with welded diffuser nozzles supported by H-piles.

Senior Engineer/Project Manager; Bird Mine Treatment Plant (2018 - Present); Glenn Springs Holdings Co, Tire Hill, PA

Responsible for design and /or project management for various tasks associated with an existing AMD treatment facility. Recent tasks include: design and construction oversight for a new 4" service water line and storage tank and replacement of the plant polymer system. Current design work includes a new raw waterline, dual 2,100 gpm 350 HP vertical turbine pumping system, new 500 foot deep borehole with 20" steel casing, electrical and instrumentation upgrades, diversion and culvert work to improve site drainage and sealing of subsidence holes.

Project Manager; LaRosa Fuels (2018 - 19); West Virginia Land Stewardship Corp. for the WVDEP Office of Special Reclamation; Monongalia/Marion County, WV.

Responsible for project management and oversight of engineering design, development of construction and erosion sediment control plans, specifications, quantities and cost estimates. The project

included site characterization and development of an active AMD treatment system to meet NPDES discharge limitations of a bond forfeiture site on the Monongahela River. The selected system included a 60 feet tall hydrated lime storage silo, mixing vault, control building, sludge pumps and storage cells, 50' diameter concrete solids contact clarifier, and polishing ponds. Detailed plans and specifications were developed to include site grading, drainage control, and the active water treatment system including detailed electrical drawings.

Project Manager; Little Conemaugh Treatment Plant Site Evaluation (2018); Pennsylvania DEP, Bureau of Abandoned Mine Reclamation; Portage Township, PA. Responsible for project management and oversight of site evaluation for suitability as a treatment plant location. Site assessments included review of available geologic, mining, hydrologic data, drilling information, borehole logs, and water level information from shallow and deep monitoring wells. Based on the collection and evaluation of geotechnical and water data, perform a quantitative assessment of the risk of vertical mining induced subsidence. Additional assessments of impacts to two downstream bridges, the Little Conemaugh River channel, and adjacent properties were required.

Project Manager; Energy Marketing Slurry Impoundment Reclamation (2018); West Virginia Land Stewardship Corp. for the WVDEP Office of Special Reclamation; Barbour County, WV. Responsible for project management and oversight of engineering design, development of construction and erosion sediment control plans, specifications, quantities and cost estimates. The project included design of the reclamation of an abandoned 30-acre fine coal refuse slurry impoundment and development of a construction plan for dewatering and grading the impoundment. The plan required spreading three feet of coarse coal refuse obtained from the embankment over the fine refuse utilizing a variation of the "surge" method. Geogrid and geotextile underlayment were specified below the coarse coal refuse cap for added strength. The anticipated construction sequence includes an incrementally enlarged working platform of coarse coal refuse from which the fine refuse is to be access and graded.

Water Acquisition and Design Engineer; Chevron Appalachian/Michigan Business Unit; Ohio & WV (2013- 2016) During this three year assignment I provided full time route engineering planning, budgeting, hydraulic design, E&S reviews, and construction management support services for the Marshall County waterline project including 13½ miles of 24" HDPE pipe over very rugged terrain, a 4 MGD intake with triplex pumping station near the Ohio River, three water booster stations, and several thousand feet of above ground waterline extensions to support individual well development.

Senior Engineer; EQT; Mountain Valley Pipeline Project, WV& VA (2016- Present) Provide design quality assurance reviews and coordination assistance as needed for development of E&S plan and permit drawings and details for a 300+ mile gas pipeline across WV and Virginia.

Project Manager/Engineer of Record; City of Canfield Ohio, Fairview Ave Drainage Improvements (2014) Engineering analysis, design, bidding, and construction management services for stormwater piping improvements. The project required hydrologic analysis and design

of system improvements that included replacement of 800 feet of existing 18" CMP stormwater piping along residential streets with 30" HDPE including site restorations and relocations of existing water and sanitary pipe where required.

Project Manager/Engineer of Record; Gulfport and Rice Energy, Ohio Well Development projects (2013-15) Well site predrill surveys, permitting, E&S and design plans for two dozen well sites including grading, access, surface water and E&S controls. Projects also included evaluation of potential water sources for frac operations.

Project Manager; Parker Run Highwall (2014); WVDEP; Marion County, WV. Responsible for project management, engineering design, and development of construction plans, specifications, and cost estimates. The project included exploratory drilling, and preparation of reclamation plans and specifications for five sites containing steep refuse piles, numerous suspected mine entries, acid mine drainage, and stream impacts. Design measures included site grading of steep refuse piles to provide stable slopes and positive drainage, installation of wet and dry mine seals, bat gates, access roads, collection channels, E&S controls, preservation of mine headings considered as historic structures, removal of refuse encroachments into stream banks, demolition of dilapidated buildings and foundations, and final revegetation.

Project Manager; Review of Coal Mining and Reclamation Permit Applications (2013), Ohio Department of Natural Resources; Locations in Harrison and Jefferson County, Ohio. Responsible to provide engineering review and comment for coal mine and reclamation permit applications including the Sterling Mining Corporation, Shean Hill No. 6 Surface Mine in Jefferson County, and the Oxford Mining Company, Branson Ridge Underground Mine in Harrison County.

Project Manager; Energy Marketing Slurry Impoundment Sediment Pond Rehabilitation (2013); WVDEP Office of Special Reclamation; Barbour County, WV. Responsible for project management and oversight of engineering design, development of construction plans, specifications, quantities and cost estimates. The project included development of a feasibility level reclamation plan and cost estimate for dewatering the 30 acre abandoned coal slurry impoundment, grading and removal of accumulated coarse and fine coal from within the impoundment, and regarding the 130 foot tall impoundment embankment in accordance with the requirements of the original mine permit. Detailed plans and specifications were developed for rehabilitation of a dilapidated sedimentation pond and spillway located at the base of the impoundment, which would be required for future dewatering of the main impoundment.

Engineer of Record; Markwest Liberty, LLC, Bluestone to Sunoco Pipeline (2013), Western Pennsylvania; Provide design reviews, coordination assistance, and sealed erosion and sediment control plans and restoration plans for a gas pipeline through Beaver and Butler Counties.



EXPERIENCE SUMMARY

Mr. Ridgway has diverse experience assisting clients with management, project management, engineering and managing the design and construction of complex projects. He has a proven history as a geotechnical engineer performing and overseeing tasks including preliminary site investigations, engineering analysis and design and construction oversight while maintaining cost-savings initiatives. Mr. Ridgway is an effective communicator and has effectively overseen and managed several projects with multiple stakeholders who share different interest. He successfully deals with complex issues in a highly stressful and ever-changing environments. Mr. Ridgway has worked in a wide variety of both public and private sector projects and is able to use this diversity of experience to provide new and creative solutions to complex problems. Mr. Ridgway will ensure that project teams have the resources and support needed to not only meet but exceed expectations

RELEVANT EXPERIENCE

EARTH RETENTION, SLIDE INVESTIGATION AND MITIGATION

Project Engineer; Slide Mitigation; Confidential Client; West Virginia. Performed investigation on an active slide along an active railway. Completed stability analyses for repair recommendations.

Project Engineer; Bridge Failure Investigation; Pennsylvania DOT; Pennsylvania. Managed and performed the installation process for multiple instruments installed as part of an investigation into the failure of an adjacent structure. Instrumentation installed includes piezometers, in-place inclinometers, multi-point borehole extensometers and integrated data loggers.

Project Manager; Slip Repair; Confidential Client; Pennsylvania. Conducted the field investigation into the location and cause of a 80 foot tall slope failure adjacent to a stream in north-central Pennsylvania. Performed stability analyses and prepared construction drawings for mitigation and repair.

Project Manager; Slip Repair; Confidential Client; Pennsylvania Completed field investigation and prepared permits, conducted stability analysis and prepared construction drawings for a 70 foot high slope failure adjacent to a stream in northeastern Pennsylvania

Project Engineer; Pipeline Slope Failure Remediation; Confidential Clients; Pennsylvania and West Virginia. Conducted over 30 field evaluations and investigations of slope failures along pipeline right of ways and on well pad sites. On selected sites conducted stability analysis and oversaw field repairs.

Project Engineer; Reinforced Steepened Slope; West Virginia Department of Highways; West Virginia. Performed design and stability analysis for a fifty-foot-tall 1500 foot long reinforced steepened slope.

Project Manager; Slip Repair; Confidential Client; Pennsylvania Completed field investigation and prepared permits, conducted stability analysis and prepared construction drawings for a 20 foot high slope failure caused by stream erosion of the toe in northeastern Pennsylvania.

Project Manager; High Wall Stability; Confidential Client; Pennsylvania Performed field investigation of existing bedrock to create a 50 foot tall highwall adjacent to a property boundary in Williamsport, Pennsylvania. Design plans included a falling rock retention system.

Project Manager; Slip Repair; Confidential Client; Pennsylvania Conducted the field investigation into the location and cause of a 40 foot tall slope failure in Washington Pennsylvania. Performed stability analyses and prepared construction drawings for mitigation and repair.

EDUCATION

BS, Civil Engineering,
West Virginia University, 2013

BS, Mining Engineering,
West Virginia University, 2013

AREA OF EXPERTISE

- Civil/Geotechnical Engineering
- Instrumentation
- Mine Site Reclamation
- Slope Stability
- Deep Foundation
- Land/Site Development
- Forensic Investigation
- Geostructures

LICENSE

Professional Engineer
(CO, MD, PA, VA, WV and WY)

OFFICE

Morgantown, WV

YEARS OF EXPERIENCE

7

YEARS WITHIN FIRM

1

CONTACT

matthew.ridgway@tetrattech.com

Project Engineer; Reinforced Steepened Slope; West Virginia Department of Highways; West Virginia. Performed design and stability analysis for a fifty-foot-tall 1500 foot long reinforced steepened slope.

Project Manager; Retaining Wall Design; West Virginia Department of Highways; West Virginia. Managed the geotechnical investigation and design for this site along in Harrison County, West Virginia. Investigation included locating borings on an active slip for the purposes of designing a retaining wall of approximately 15 feet in height and 40 feet in length. Calculated forces on the wall and analyzed for design and selection of beams for a pile and lagging wall using LPILE. Complete stability analysis using Slope/W and RocScience Slide software.

Project Manager; Retaining Wall and Fill Instrumentation; Yeager Airport; West Virginia. Managed and performed the installation process for several instruments in a large fill area that included two retention walls. Instrumentation installed included piezometers, shape arrays, strain gauges, strand meters, multi-point borehole extensometers, data loggers and threads.

Project Manager; Retaining Wall Design; West Virginia Department of Highways; West Virginia. Managed the geotechnical investigation and design for this site along in Harrison County, West Virginia. Investigation included locating borings on an active slip for the purposes of designing a retaining wall of approximately 25 feet in height and 30 feet in length. Calculated forces on the wall and analyzed for design and selection of beams for a pile and lagging wall using LPILE. Complete stability analysis using Slope/W and RocScience Slide software.

Project Engineer; Abutment Wall Design; West Virginia Department of Highways; West Virginia. Performed calculations for forces on bridge abutments walls and designed abutment walls and foundations.

Project Engineer; Slope Failure Investigation; Confidential Clients; West Virginia. Worked with Expert Witness to conduct field and forensic investigations of 5 slope failures in West Virginia, including Yeager Airport's 210' high fill slope. Conducted all field investigation and performed reverse engineering to determine cause and location of failure. Provided the Expert Witness with data for testimony.

Project Manager – Retaining Wall Design; City of Morgantown; West Virginia. Managed the geotechnical investigation and design for this site along in the city of Morgantown, West Virginia. Investigation included locating borings on an active slip for the purposes of designing a retaining wall of approximately 20 feet in height and 155 feet in length. Calculated forces on the wall and analyzed for design and selection of beams for a pile and lagging wall using LPILE. Complete stability analysis using Slope/W and RocScience Slide software.

Project Manager; Camden Street Storage Tunnel, Clark Construction; Maryland. Managed and performed the installation process for multiple piezometers and multi-point borehole extensometers for a utility storm drainage tunnel.

Project Manager; Retaining Wall Design; Allegheny County; Maryland. Managed the geotechnical investigation and design for this site along in Allegheny County, Maryland. Investigation included locating borings on an active slip of coal refuse for the purposes of designing a retaining wall of approximately 15 feet in height and 176 feet in length. Calculated forces on the wall and analyzed for design and selection of beams for a pile and lagging wall using LPILE. Complete stability analysis using Slope/W and RocScience Slide software.

Project Manager; Retaining Wall Failure, Confidential Client; West Virginia. Managed and performed the installation process for the investigation into a retention wall failure including the installation of multiple in-place inclinometers.

Project Engineer; Retention Wall; Confidential Client; Ohio. Oversaw the re-design and construction of a pile and lagging retention wall on a country road in Monroe County, Ohio.

Project Manager; Retaining Wall Design; Fairmont Regional Medical Center; West Virginia. Managed the geotechnical investigation and design for this site in the city of Fairmont, West Virginia. This project consisted of the selection and design of a segmented block retaining as well as the foundation recommendations for the wall.