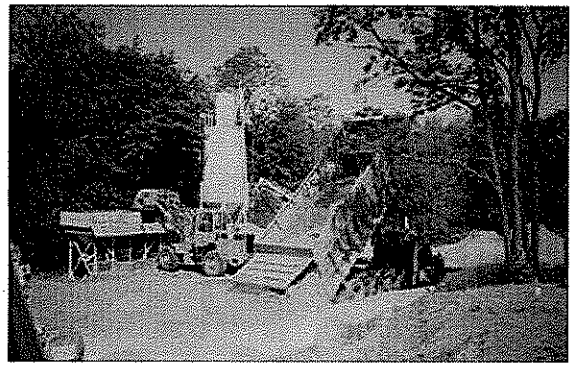
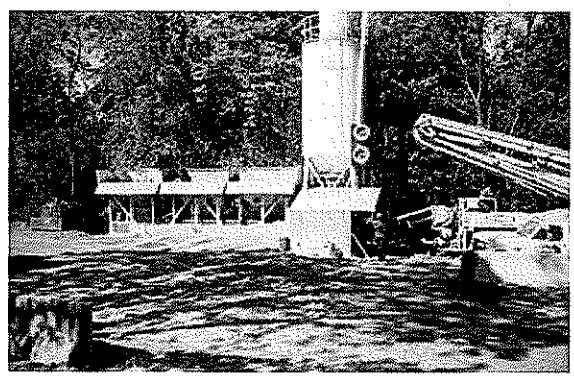
RFQ: DEP14800
November 5, 2009

Expression of Interest (EOI)
Fairmont Five Subsidence Design





Prepared by:

Tetra Tech
Foster Plaza 7
661 Andersen Drive
Pittsburgh, PA 15220

Point of Contact & Telephone Number:

Mr. Thomas Gray, PE
T: 412.921.8794
F: 412.921.4040
email: thomas.gray@tetratech.com

Prepared for:

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

TETRA TECH

November 5, 2009

Mr. Chuck Bowman
State of West Virginia, Purchasing Division, P.O. Box 50130
Charleston, West Virginia 25305-0130

Subject: RFQ #DEP14800 – Fairmont Five Subsidence Design

Dear Mr. Bowman:

Tetra Tech is pleased to submit our Expression of Interest to perform design services prepared in reply to RFQ #DEP14800 for the State of West Virginia. As outlined in our Expression of Interest, Tetra Tech, our project team, and its personnel have completed work on ***hundreds of mining projects including over 50 subsidence projects***. These projects have included services that will be needed for this project such as mine subsidence design, grouting, drilling, and construction monitoring and management. Our firm has a large amount of experience with projects where mine subsidence has affected residential properties.

This project will be managed out of Tetra Tech's Pittsburgh office and this location has ***four (4) available abandoned mine land teams and four (4) West Virginia registered Professional Engineers*** to work on projects. Our firm also has additional West Virginia PEs in the area and has an office location in Charleston, West Virginia, which can provide support if needed. That office's largest client is the West Virginia Department of Environmental Protection. We welcome the opportunity to perform work in West Virginia as we continue to develop our Charleston location. Tetra Tech is joined on this project by:

TRIAD Engineering (TRIAD), which will provide surveying and drilling services. Our firms have previously worked together. The Triad office for this project is located in Morgantown, West Virginia.

Richard Gray, PG of DiGioia, Gray and Associates, LLC, who will provide expert review of the project. He has worked as a consultant to Tetra Tech on similar projects and is an expert on mine subsidence grouting. He and Tom Gray have collaborated on various subsidence projects for more than 15 years, many within the Fairmont area.

Our experienced team is led by Mr. Thomas Gray, PE. Mr. Gray is a licensed Professional Engineer in five states including West Virginia and has extensive mining experience, having worked on over ***100 mining projects*** throughout his career. He developed the mine grouting specification for grouting approximately 25 acres at the Omega Mine Site in northern West Virginia and recently completed a similar project to stabilize mine entries under a new power plant for Duke Energy in Indiana. He has also completed many investigations of similar subsidence projects for the Office of Surface Mining. Our team includes four Professional Engineers registered in the State of West Virginia and our proposed key personnel have over ***300 years*** of combined experience relevant to this project.

As requested in the RFP we have provided one original submittal, one copy, and one copy on CD-ROM. We appreciate this opportunity to provide this proposal, and look forward to answering any questions you may have. If you require any additional information, please feel free to contact us at (412) 921-7090.

Very truly yours,

Mr. Thomas Gray, PE
Energy and Natural Resources Department Manager

Mr. Mark Speranza, PE
Pittsburgh Office Manager

Enclosures

Tetra Tech NUS, Inc.
661 Andersen Drive, Pittsburgh, PA 15220
Tel 412.921.7090 Fax 412.921.4040 www.ttnus.com

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER	PAGE
DEP14800	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
CHUCK BOWMAN
304-558-2157

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO
ENVIRONMENTAL PROTECTION
DEPARTMENT OF
OFFICE OF AML&R
601 57TH STREET SE
CHARLESTON, WV
25304
304-926-0499

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
10/06/2009				

BID OPENING DATE: 11/05/2009 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	JB		906-29		

FAIRMONT FIVE SUBSIDENCE DESIGN

EXPRESSION OF INTEREST

THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, IS SOLICITING EXPRESSIONS OF INTEREST FOR PROFESSIONAL ENGINEERING DESIGN SERVICES AND CONSTRUCTION MONITORING SERVICES AT THE FAIRMONT FIVE SUBSIDENCE PROJECT IN MARION COUNTY, WEST VIRGINIA, PER THE FOLLOWING BID REQUIREMENTS AND ATTACHED SPECIFICATIONS.

BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THIS CONTRACT IS AUTOMATICALLY NULL AND VOID AND IS TERMINATED WITHOUT FURTHER ORDER.

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE Mark Spencer TELEPHONE 412-921-8916 DATE 11/3/09

TITLE Operations Manager FEIN 95-4660169

ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

RFQ No. DEP14800

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

VENDOR OWING A DEBT TO THE STATE:
West Virginia Code §5A-3-10a provides that: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

PUBLIC IMPROVEMENT CONTRACTS & DRUG-FREE WORKPLACE ACT:
If this is a solicitation for a public improvement construction contract, the vendor, by its signature below, affirms that it has a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the ***West Virginia Code***. The vendor **must** make said affirmation with its bid submission. Further, public improvement construction contract may not be awarded to a vendor who does not have a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the ***West Virginia Code*** and who has not submitted that plan to the appropriate contracting authority in timely fashion. For a vendor who is a subcontractor, compliance with Section 5, Article 1D, Chapter 21 of the ***West Virginia Code*** may take place before their work on the public improvement is begun.

ANTITRUST:
In submitting a bid to any agency for the state of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the state of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the state of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the state of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership or person or entity submitting a bid for the same materials, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

LICENSING:
Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agencies or political subdivision. Furthermore, the vendor must provide all necessary releases to obtain information to enable the Director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

CONFIDENTIALITY:
The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf.

Under penalty of law for false swearing (***West Virginia Code*** §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

Vendor's Name: Tetra Tech NUS, Inc.

Authorized Signature: Mark Spencer Date: 11/13/09

Attachment B

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE Attachment "B"

PROJECT NAME	DATE (DAY, MONTH, YEAR)	FEIN
Fairmont Five Subsidence Design	5, November, 2009	95-4660169

1. FIRM NAME	2. HOME OFFICE BUSINESS ADDRESS	3. FORMER FIRM NAME
Tetra Tech NUS, Inc.	Foster Plaza 7, 661 Andersen Drive Pittsburgh, Pennsylvania	NUS Corporation NUS Environmental Corporation Brown & Root Environmental

4. HOME OFFICE TELEPHONE	5. ESTABLISHED (YEAR)	6. TYPE OWNERSHIP	6a. WV REGISTERED DBE (Disadvantaged Business Enterprise)
(412) 921-7090	1960	Corporation	No

7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE

Foster Plaza 7, 661 Andersen Drive, Pittsburgh, PA 15220 / (412) 921-7090 / Mark Speranza, PE / 5 AML Personnel in this office

8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM	8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS
Mr. Ronald Chu, PE - President Mr. Mark Perry, PE - Regional Manager Mr. John Trepanowski, PE - Regional Manager Mr. Steven Giannino, PE - Regional Manager	Mr. Thomas Gray, PE - Energy and Natural Resources Manager (412) 921-8794

9. PERSONNEL BY DISCIPLINE

39 ADMINISTRATIVE	2 ECOLOGISTS	— LANDSCAPE ARCHITECTS	— STRUCTURAL ENGINEERS
— ARCHITECTS	— ECONOMISTS	3 MECHANICAL ENGINEERS	— **SURVEYORS**
4 BIOLOGIST	1 ELECTRICAL ENGINEERS	**5 MINING ENGINEERS**	— TRAFFIC ENGINEERS
7 CADD OPERATORS	27 ENVIRONMENTALISTS	— PHOTOGRAMMETRISTS	45 OTHER
13 CHEMICAL ENGINEERS	1 ESTIMATORS	— PLANNERS: URBAN/REGIONAL	
23 CIVIL ENGINEERS	**19 GEOLOGISTS**	— SANITARY ENGINEERS	
2 CONSTRUCTION INSPECTORS	— HISTORIANS	2 SOILS ENGINEERS	
— DESIGNERS	— HYDROLOGISTS	— SPECIFICATION WRITERS	193 TOTAL PERSONNELL
— DRAFTSMEN			

TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: 4
***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 N/A

11. OUTS[illegible] KEY CONSULTANTS/SUB-CONSULTANTS ANTICIPATED TO [illegible] USED. Attach "AML Consultant Qualification Questionnaire".

NAME AND ADDRESS: TRIAD Engineering 219 Hartman Run Rd Morgantown, West Virginia 26505	SPECIALTY: Surveying and Drilling	WORKED WITH BEFORE _X_ Yes ____ No
NAME AND ADDRESS: Digioia, Gray and Associates, LLC 570 Beatty Road Monroeville, Pennsylvania 15146	SPECIALTY: Expert Support	WORKED WITH BEFORE _X_ Yes ____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE ____ Yes ____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE ____ Yes ____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE ____ Yes ____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE ____ Yes ____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE ____ Yes ____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE ____ Yes ____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE ____ Yes ____ No

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

YES Description and Number of Projects: Tetra Tech staff and consultants have completed **over 100 abandoned mine land projects** - Attachment C is only a partial listing. Our Project Manager, Thomas Gray, PE, has been working on abandoned mine reclamation projects for the past 21 years, with many in West Virginia. Our advisor, Richard Gray, PG, has been involved with mine reclamation since the early 1980s. He has completed over 100 projects in West Virginia for the WVDEP. They have worked together on many of these projects. Tetra Tech has been involved with mine reclamation for many years throughout the western U.S. and is providing similar services in the Appalachian coal fields. Our Charleston, WV office will provide local support as needed.

B. **Are your firm's personnel experienced in Soil Analysis?**

YES Description and Number of Projects: Tetra Tech has conducted thousands of soil investigations worldwide that included sampling and analysis. Along with this site work, we have provided thousands of reports presenting the results of the investigations. We have extensive specialized experience and technical competence in providing soil sampling and analysis services, including **more than 6,000 environmental site characterizations (including at mining sites) and more than 1,000 geotechnical investigations.** We have trained and experienced field sampling crews available to support this project.

C. **Are your firm's personnel experienced in hydrology and hydraulics?**

YES Description and Number of Projects: Tetra Tech has over **three decades of experience** in hydrology and hydraulics. Our expertise and knowledge in evaluating hydrologic systems is applied to specific water resource project types including water resource and flood damage assessment, flood control designs (including channels, levees, detention basins and bank protection, hydraulic structure design, erosion and sedimentation studies, stream restoration and wetland design, dam and levee safety evaluations, reservoir operation/optimization studies, flood-control and flood management studies and mapping, development of flood warning systems, dam break flood studies and contingency planning, stormwater drainage design, surface and groundwater supply analysis. The basis of these hydrologic studies is the application of HEC software such as HEC-HMS, GeoHMS, HECFFA, HEC-SSP, HEC-DSSVue, HEC-ResSim, CWMS and legacy software such as HEC-1, HEC-5, HEC-DSS, and COED.

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

YES Description and Number of Projects: Tetra Tech employs 15 GIS/CADD personnel in its Pittsburgh office and has all necessary software for map development. Our firm hires subcontractors when necessary for aerial photography to develop contour maps. Tetra Tech has completed aerial photography and/or contour mapping for **over 100 projects.**

E. **Are your firm's personnel experienced in domestic waterline design? (Include any experience in evaluation of aquifer degradation as a result of mining.)**

YES Description and Number of Projects: Tetra Tech has extensive expertise in modeling, designing, and building reliable, safe and cost-effective water transmission and distribution systems. Our experience encompasses all aspects of transmission and distribution systems, including large diameter water mains, distribution piping, booster pumping stations, storage tanks and metering facilities. We have performed domestic water line design projects nationwide for **hundreds of municipalities and water authorities.**

F. **Are your firm's personnel experienced in Acid Mine Drainage Evaluation and Abatement Design?**

YES Description and Number of Projects: Tetra Tech and its personnel have extensive acid mine drainage evaluation and abatement design experience. Our firm has **recently completed 5 acid mine drainage evaluation/abatement design projects** and our proposed Project Manager, Thomas Gray, PE, has completed **dozens of acid mine drainage and abatement projects.** He also managed an open-end contract for the Maryland Bureau of Mines, which included over 16 projects relating to mining, acid mine drainage treatment, and mine reclamation.

13. PERS L HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **SPONSIBLE FOR AML PROJECT DESIGN** (Furnish comple data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
Gray, Thomas, A., PE Project Manager	YEARS OF AML DESIGN EXPERIENCE: 22	YEARS OF AML RELATED DESIGN EXPERIENCE: 34	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 16

Brief Explanation of Responsibilities

Mr. Gray is an experienced mining engineer who has over 22 years of AMR and mine subsidence experience. This experience includes a WVDEP project where coal combustion byproduct based grout was injected into 25 acres of abandoned mine workings to reduce subsidence potential. Other projects include the MD Bureau of Mines Streyer Run Mine Subsidence Assessment, the Capels Resources Mining Subsidence Assessment, the Duke Power Mine Subsidence project, the West Elk Mine Subsidence Evaluation, and the Consol Energy Longwall Mining Subsidence project. He previously worked at GAI, managing their Charleston, WV office. Since 2000, Mr. Gray has managed or was a senior consultant on 53 projects involving reclamation of abandoned mines, including managing 30 projects for the Office of Surface Mining and open-end contracts for PADEP and the MD Bureau of Mines. He has consulted to the WVDOH on mining issues and his WVDEP projects include Omega mine grouting, Owings mine reclamation, Majesty mine reclamation, Godby branch water supply extension, and Left Hand Fork Refuse fire control. He has published over 30 articles related to mining and reclamation, including the chapter entitled, "Mine Closure, Sealing, and Abandonment" in SME's Mining Engineering Handbook.

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

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
Society of Mining Engineers - Distinguished Member Society of American Military Engineers Engineering Society of Western Pennsylvania	Professional Engineer, 1988, West Virginia Professional Engineer, 1978, Pennsylvania Professional Engineer, 1980, Virginia Professional Engineer, 2009, Ohio Professional Engineer, 1989, Maryland

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		
Gray, PG, Richard, E. Deputy Project Manager	YEARS OF AML DESIGN EXPERIENCE: 26	YEARS OF AML RELATED DESIGN EXPERIENCE: 26	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 11

Brief Explanation of Responsibilities

Mr. Gray will consult with Tetra Tech and assist in selecting the design approach for the team. He worked in a similar capacity for the Tunnelton and Fisher Run projects that Tetra Tech completed for the WVDEP. He has also completed numerous subsidence investigations and mitigation designs within the City of Fairmont, West Virginia for the WVDEP. He will also be used to conduct a peer review of the design plans and specifications before they are finalized. He is highly regarded in the AML design field. He was the project manager on all of GAI's AML projects for the WVDEP from 1983 to 1995 and served as a technical consultant for all of the GAI projects with WVDEP from 1995 until 2005.

EDUCATION (Degree, Year, Specialization)
BS, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
American Society of Civil Engineers American Association for the Advancement of Science Society of American Military Engineers	Professional Geologist, Pennsylvania Professional Geologist, Virginia Professional Geologist, Delaware Professional Geologist, North Carolina Professional Geologist, South Carolina Professional Geologist, Florida Professional Geologist, Indiana Professional Geologist, Kentucky Professional Geologist, Illinois Professional Geologist, Alabama Professional Geologist, California Professional Geologist, Wyoming

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		
Hallman, PE, PG, Dave Project Advisor	YEARS OF AML DESIGN EXPERIENCE: 20	YEARS OF AML RELATED DESIGN EXPERIENCE: 20	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0

Brief Explanation of Responsibilities

Mr. Hallman has over 20 years of experience specializing in geotechnical engineering and construction on a variety of mining and civil engineering projects throughout the world. His project experience includes the ODOT Highway 33 Mine Subsidence and Mitigation project, the Colorado Division of Reclamation, Mines and Safety (CDRMS) Mine Fire and Subsidence Investigation, the CDRMS Colorado Springs Mine Subsidence Investigations, the Wyoming DEQ Mine Subsidence Evaluation and Mitigation, and the Sunrise Mine Subsidence Evaluations. His technical expertise includes mine subsidence, static and dynamic stability of embankments and natural slopes, landslide evaluation, rock slope stability, seismic risk assessments, liquefaction evaluations, dynamic deformation analyses, liner and seepage cutoff system design and evaluation, tailings and water dam design and construction, and design and construction of heap leach and landfill facilities.

EDUCATION (Degree, Year, Specialization)
BS, 1983, Geological Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
	Professional Engineer, 1994, Missouri Professional Engineer, 2002, Texas Professional Engineer, 1990, Alaska Professional Engineer, 1989, Colorado Professional Engineer, 2002, Wyoming Professional Engineer, 1996, Idaho Professional Geologist, 2004, Wyoming

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		
Berenbrok, Allan, R., PE Project Engineer	YEARS OF AML DESIGN EXPERIENCE: 2	YEARS OF AML RELATED DESIGN EXPERIENCE: 2	YEARS OF DOMESTIC WATERLINE EXPERIENCE: 0

Brief Explanation of Responsibilities

Mr. Berenbrok has over 29 years of professional design experience. His project experience includes serving as the Lead Design Engineer for the WVDEP Office of AML and Reclamation's Weston and Tunnelton Abandoned Mine Portals Closure Project, the Bear Run Phase II Acid Mine Drainage Passive Treatment System Design, and the Gladden Mine Reclamation Acid Mine Drainage Treatment System Design.

EDUCATION (Degree, Year, Specialization)

MS, 1984, Systems Management
BS, 1980, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
NAIOP ICSC	Professional Engineer, 1988, Pennsylvania

13. PERS L HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **SPONSIBLE FOR AML PROJECT DESIGN** (Furnish comple 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:
Furniss, Matthew, D., EIT Project Engineer	1	1	0

Brief Explanation of Responsibilities

Mr. Furniss has six years of mining engineering experience, which includes design, construction, research and development, and CAD/Drafting. His project experience includes serving as a Project Engineer for the Fishing Run Stream Sealing project, which included the identification of four stream channels losing flow through apparent sinkhole subsidence events. Other mining projects include the WVDEP Office of AML and Reclamation's Weston and Tunnelton Abandoned Mine Portals Closure Project, the Bear Run Phase II Acid Mine Drainage Passive Treatment System Design, the Gladden Mine Reclamation Acid Mine Drainage Treatment System Design.

EDUCATION (Degree, Year, Specialization)

MS, 2009, Mining and Minerals Engineering
BS, 2007, Mining and Minerals Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
Society for Mining, Metallurgy, and Exploration	EIT, 2007, Virginia

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 EXPERIENCE:
Byle, Michael, J., PE Project Engineer	2	25	10

Brief Explanation of Responsibilities

Mr. Byle has more than 30 years of professional experience in geotechnical engineering. His background includes mine subsidence projects for a variety of clients including the U.S. Office of Surface Mining and the Pennsylvania Department of Transportation. Mr. Byle also has extensive experience in geotechnical grouting including grouted anchors in rock and for structural rehabilitation, as well as investigation and rehabilitation of structures and foundations, soil improvement techniques, exploration and mitigation design for karst, and project management and construction oversight for complex specialty geotechnical projects. Specific technical experience includes evaluation and stabilization of soft sediments, dredged materials, grouting and grouting design, and applications of engineering geophysics.

EDUCATION (Degree, Year, Specialization)
MS, 1981, Civil Engineering
BS, 1978, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
Society of American Military Engineers American Society of Civil Engineers	Professional Engineer, 1992, Pennsylvania Professional Engineer, 1989, Virginia Professional Engineer, 1990, Maryland Professional Engineer, 2006, Minnesota Professional Engineer, 2006, New Jersey Professional Engineer, 1993, Delaware Professional Engineer, 2008, New York Professional Engineer, 2008, Florida Professional Engineer, 2009, New Hampshire Professional Engineer, 1983, Colorado

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 EXPERIENCE:
Klimek, Anthony, P., PE Project Engineer	4	4	4

Brief Explanation of Responsibilities

Mr. Klimek has more than 26 years of professional experience and has successfully managed a variety of mine drainage projects. His career includes a vast amount of mining experience including the Ohio Department of Natural Resources (ODNR) Abandoned Mine Land Remedial Design project, the ODNR Barton Acid Mine Drainage Design Project, the Emerald Resources Coal Plant Drainage Improvements Project, the ODNR Interstate 70/77 Abandoned Mine Land Drainage Control Plan Design, and the National Coal Association/American Mining Congress Surface Mining Regulations Impact Study. He also has extensive experience with the preparation of mine drainage permit applications.

EDUCATION (Degree, Year, Specialization)

MS, 1984, Business Administration
BS, 1980, Civil Engineering Technology

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
Society of American Military Engineers American Society of Civil Engineers	Professional Engineer, 1987, West Virginia Professional Engineer, 1984, Pennsylvania Professional Engineer, 2001, Kentucky Professional Engineer, 1993, Ohio Professional Engineer, 2001, North Carolina

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:
Cummings, Biff, D., PE Project Engineer	15	29	0

Brief Explanation of Responsibilities

Mr. Cummings' expertise includes mine reclamation and subsidence, water/soil consolidation, slope stability, settlement analysis, fill placement and the full range of civil site designs for developments and abandoned mine reclamation (mine subsidence abatement, mine drainage and seals, regarding and vegetation of spoil piles, landslide investigation and abatement, mine and spoil fires and stream channel restoration). He has performed subsidence evaluations and AML related activities under contracts in WV, PA OH, MD, and VA including dealing with subsidence issues affecting residential properties. His subsidence experience includes various home mining subsidence projects for the Office of Surface Mining, the Parkway Center Mall Mine Subsidence Investigation and Mine Grouting project, the Union Pacific Railroad Subsidence investigation, and the AEP Mine Subsidence Litigation Case.

EDUCATION (Degree, Year, Specialization)
BS, 1978, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
American Society of Civil Engineers	Professional Engineer, 2004, West Virginia Professional Engineer, 1984, Pennsylvania Professional Engineer, 1994, Ohio Professional Engineer, 2006, Illinois Professional Engineer, 2005, Alabama Professional Engineer, 2004, Indiana

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		
Giovannitti, Ernest, PE Project Advisor	YEARS OF AML DESIGN EXPERIENCE: 14	YEARS OF AML RELATED DESIGN EXPERIENCE: 14	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0

Brief Explanation of Responsibilities

Mr. Giovannitti has over 39 years of mining experience and will serve as a Project Advisor on our team. He was the former Director of the Bureau of Mining and Reclamation and the Director of Abandoned Mine Reclamation for PADEP for 17 years. He also previously served as the Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management. Mr. Giovannitti's experience has included managing a multi-disciplinary staff in reclaiming hazardous conditions and water pollution problems caused by coal mining activity. Mr. Giovannitti managed corrective actions and designed solutions to solve these problems.

EDUCATION (Degree, Year, Specialization)

MS, 1976, Sanitary Engineering
BS, 1964, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
National Association of Abandoned Mine Land Programs	Professional Engineer, Pennsylvania Professional Engineer, Maryland

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		
Drane, III, PG, Lawrence, A. Project Geologist	YEARS OF AML DESIGN EXPERIENCE: 3	YEARS OF AML RELATED DESIGN EXPERIENCE: 16	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0

Brief Explanation of Responsibilities

Mr. Drane has over 17 years experience in the environmental field and has spent three years in the surface mining industry completing mining permits and performing mapping and surveying. His experience includes long-term remedial investigations/remedial actions, Phase I and Phase II investigations, long-term environmental risk-based analysis, brownfield site investigations and closures, soil and groundwater remediation for VOCs, SVOCs, petroleum hydrocarbons, PCBs, and metals, underground storage tank investigations and closures, supervision of excavations and slurry wall construction, RCRA tank and facility closures, and design and construction of groundwater stripping systems.

EDUCATION (Degree, Year, Specialization)

MS, 1993, Hydrogeology and Geophysics
BS, 1989, Geology (Minor in Civil Engineering)

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
	Professional Geologist, 1995, Pennsylvania

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 EXPERIENCE:
Ludwig, John Project Scientist	1	1	0

Brief Explanation of Responsibilities

Mr. Ludwig is the director of Tetra Tech's Charleston, WV office of TMDL and Water Resources Center. He is a senior environmental scientist with over ten years of experience providing technical and management support for clients in the areas of water resources, watershed and water quality assessment, watershed modeling and Total Maximum Daily Load (TMDL) development. In support of EPA and the WVDEP Division of Water and Waste Management (DWWM), he has served as the Project Manager in the development of over 1,900 EPA-approved TMDLs in West Virginia. He currently serves as the Project Manager for the existing TMDL contract with the WVDEP DWWM that includes the development of TMDLs for total iron, total manganese, dissolved aluminum, pH, selenium, fecal coliform bacteria, and biological impairments throughout the State of West Virginia.

EDUCATION (Degree, Year, Specialization)

MS, 1997, Environmental Pollution Control
BS, 1995, Environmental Science

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
American Water Resources Association Water Environment Federation	

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:
Wilkes, PWS, Samuel, P. Project Scientist	0	5	0

Brief Explanation of Responsibilities

Mr. Wilkes is an environmental scientist providing technical support to clients, such as the WVDEP and the WVDHHR, US Forest Service, Bureau of Land Management, and the EPA. He also provides technical support to clients pertaining to abandoned mine site investigations, abandoned mine land inventories, contaminant transport in surface waters, environmental contamination, and potentially responsible party searches. Mr. Wilkes has experience in investigating hard rock mines and mill sites for contaminants such as arsenic, copper, cyanide, lead, mercury, uranium, zinc, and organic compounds. He is proficient in contaminant source identification and characterization, site assessments contaminant migration pathways, and customized surface water modeling for abandoned mine sites.

EDUCATION (Degree, Year, Specialization)

MS, 2003, Environmental Science and Policy
BS, 1996, Earth and Environmental Science

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
Society of Wetland Scientists Trout Unlimited	Professional Wetland Scientist, 2003 Certified Forest Stand Delineator and Conservation Planner, 2003, Maryland

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		
Hoppe, Ben CAD Designer	YEARS OF AML DESIGN EXPERIENCE: 1	YEARS OF AML RELATED DESIGN EXPERIENCE: 5	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0

Brief Explanation of Responsibilities

Mr. Hoppe is a CAD Designer with over five years of relevant experience currently working in Tetra Tech's Pittsburgh office. He has performed design work on a variety of mining-related projects for the WVDEP including the Tunnelton Abandoned Mine Portals Closure Project, the Posey/Fisher Run AML project, and the Paint Branch AML project. His CAD design experience includes all phases of civil design work including but not limited to, site grading, proposed roadway geometry layout and utility layout. Mr. Hoppe is experienced in subdivision design, landfill design, and utility work and capable of providing accurate earthwork volumes for designs, layout of sewer and storm sewer systems (gravity and low pressure) using 3D models and complex grading designs using 3D civil software ensuring accuracy.

EDUCATION (Degree, Year, Specialization)

AAS, 2004

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES
TR-55, STABL5, HEC-HMS, GeoHMS, HECFFA, HEC-SSP, HEC-DSSVue, HEC-ResSim, CWMS and legacy software such as HEC-1, HEC-5, HEC-DSS and COED
Microsoft Office Professional and Microsoft Project
Adobe Photoshop
Adobe Acrobat Version 8.0
AutoCAD Map 3D 2008 / AutoCAD 2008
AutoDesk Civil 3D 2007
ESRI ArcGIS 9.2
ESRI ArcView 3.3
Bentley PondPack (Haestad Methods) Version 9.0
Bentley Flow Master (Haestad Methods)
Bentley HEC-Pack
STABL5M
Hydrologic Evaluation of Landfill Performance (HELP)
Groundwater Vistas Version 3.5 (MODFLOW based 3D finite difference model, including MT3D, RT3D, MODPATH, MODFLOWT, and SWIFT Components
GMS (MODFLOW based 3D finite difference model, including MT3D, RT3D, MODPATH, and 3-D spatial analysis components)
Visual MODFLOW (MODFLOW based 3D finite difference model, including MODPATH)
SWANFLOW (3D finite difference model specializing in 3-phase fluid flow in porous media - water, NAPL, air)
Several analytical-based software packages including BIOCHLOR, BIOSCREEN, and SESOIL

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
Mark West Pipeline Alignment Mine Subsidence Study, West Virginia	MarkWest 100 Plaza Drive Atlasburg, PA 15004	Subsidence Investigation	Not yet determined	10%
Bear Run Acid Mine Drainage Passive Treatment System, Passive Treatment, Pennsylvania	Indiana County Conservation District in conjunction w/PADEP 1432 Route 286 Hwy. E Indiana, PA 15701	Design of a passive acid mine drainage treatment system, site grading, hydraulic analysis, E&S control permitting	Not yet determined	95%
Gladden Mine Site Grading Plan and Acid Mine Drainage Treatment System, Treatment System, Pennsylvania	South Fayette Conservation Group in conjunction w/PADEP 515 Millers Run Road Morgan, PA 15064	Site grading plan, design of acid mine drainage treatment system to treat a max. flow rate of 1,500 gpm of AMD flow	$3,600,000	Design of this project is complete, but construction has not yet begun
Tunnelton Mine Portal Closure Design, West Virginia	WVDEP Office of Abandoned Mine Lands and Reclamation 105 S. Railroad Street Philippi, WV 26416	Mine portal closure design, development of regrading plans that balance cut and fill, Construction monitoring	$62,000	Design of this project is complete, but construction has not yet begun
Fisher Run (Posey) Mine Reclamation, AML Reclamation, West Virginia	WVDEP Office of Abandoned Mine Lands and Reclamation 105 S. Railroad Street Philippi, WV 26416	Design of closure of mine portals allowing AMD flow into a stream, drilling, surveying	$292,000	Design complete, construction scheduled to be completed in 2010

TOTAL NUMBER OF PROJECTS: 5

TOTAL ESTIMATED CONSTRUCTION COSTS: $3,954,000

16. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS SERVING AS A SUB-CONSULTANT TO OTHERS

PROJECT NAME, TYPE AND LOCATION	NATURE OF FIRMS RESPONSIBILITY	NAME AND ADDRESS OF OWNER	ESTIMATED COMPLETION DATE	ESTIMATED CONSTRUCTION COST	
				ENTIRE PROJECT	YOUR FIRMS RESPONSIBILITY
N/A	N/A	N/A	N/A	N/A	N/A

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)
West Elk Mine Subsidence Evaluation and Report, Subsidence Evaluation and Report, Colorado	Mountain Coal Company 5174 Highway 133 Somerset, CO 81434	N/A	2008	N/A
Colorado Springs Mine Subsidence Abatement, Colorado	Colorado Department of Natural Resources, Division of Reclamation/Mining/Safety 1313 Sherman St., Rm. 215 Denver, CO 80203	N/A	2009	N/A
Colorado School of Mines Subsidence Abatement, Colorado	Colorado Department of Natural Resources, Division of Reclamation/Mining/Safety 1313 Sherman St., Rm. 215 Denver, CO 80203	N/A	2008	N/A
Sunrise Mine AML Subsidence Monitoring, Wyoming	Wyoming Department of Environmental Quality 122 West 25th St, Herschler Building Cheyenne 82002	N/A	2006	N/A
Report on Current Mine Rescue Practices in China, Report, China	Center for Disease Control, NIOSH	N/A	2008	N/A
Ohio Valley Coal Company Mine Seal Closure Designs, Closure Designs, Ohio	Ohio Valley Coal Company 56854 Pleasant Ridge Road Alledonia, OH 43902	N/A	2008	N/A

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
N/A					

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.

Please see our accompanying information for additional qualifications.

20. The foregoing is a statement of facts.

Signature: Mark P. Speranza

Title: Pittsburgh Office Manager

Date: November 5, 2009

Printed Name: Mark Speranza, PE

Attachment C

AML and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C=Corp. P=Personal *	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS														PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional					
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/Mitigation/ Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	Thomas Gray, PE	Richard Gray, PG	Biff Cummings, PE	Dave Hallman, PE, PG	Matthew Furniss, EIT	Allan Berenbrok, PE
Majorsville, PA Mine Subsidence Study	C	Yes							X								X	M				P	P
Marjol Plant RFI and Mine Subsidence Evaluation	C/P	Yes				X			X				X				X	P					
WVDEP Owings Mine Grouting Design	P			X	X	X	X				X	X	X	X	X	X	X	M	M				
Fairmont WV Subsidence	P								X								X			M			
Duke Energy Subsidence Grouting Design	P			X	X	X			X		X	X	X		X		X	M	M				
MD DOE BOM Streyer Run Mine Subsidence	P								X									M	M				
Capels Resources Mining Property Subsidence Study	P								X									P	M				
OSM Subsidence Evaluations in MD, PA, OH	P			X					X									P		P			
OSM Brown Residence Subsidence	P			X					X		X						X	M/P	M				
Ruberto Residence Subsidence	P			X					X		X		X				X	M/P	M				
OSM Francis Street Subsidence	P			X					X								X	M/P	M				
OSM Villas on the Greens Subsidence	P			X		X			X				X				X	M/P	M				
Beech Bottom, WV AEP Windsor Coal Subsidence	P								X								X			M			

* 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.

AML and RELATED PROJECT EXPERIENCE MATRIX

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ODOT Highway 33 Subsidence Mitigation	C	Yes	X						X								X				P		
Colorado Springs Mine Subsidence Project	C	Yes	X						X								X				P		
Colorado School of Mines Subsidence Abatement	C	Yes							X								X				P		
Sunrise Mine AML / Subisidence Monitoring	C	Yes							X								X				P		
IHI Mine Fire and Subsidence Evaluation	C	Yes						X	X								X				M/P		
Wyoming AML Subsidence Hazards Mitigation	C	Yes							X								X				M/P		
West Elk Mine Subsidence Evaluation and Report	C/P	Yes				X			X								X	M/P						
WVDEP Hydrology and Water Quality Modeling	C	Yes	X	X		X	X					X		X		X							
WVDEP Omega AMD and Subsidence Prevention	P			X	X	X	X		X		X	X	X	X		X	X	M/P	P					
Parkway Center Mall Subsidence Evaluation	P								X								X			M			
Union Pacific Railroad Subsidence Investigation	P								X								X			P			
Babst Calland Subsidence Investigation	P								X								X			M			
OSM Bridgeville Home Subsidence Investigation	P								X								X			P			

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Various Canada Coal Mine Subsidence Projects	P								X								X		P				
Ebasco Services Subsidence Evaluation	P								X										P				
Bureau of Mines Bruceton Subsidence Study	P								X										P				
Appalachian Reg. Comm. Subsidence Control Study	P								X								X		P				
Bureau of Mines Subsidence Survey	P								X								X		P				
Indianapolis Power & Light / EPRI Subsidence Project	P								X									M	P				
University of Missouri, Rolla Subsidence Courses	P																		P				
Tonkin and Taylor Subsidence Study	P								X										P				
Sullivan-Hayes Subsidence and Stabilization Program	P								X								X		P				
Standard Lime and Cement Subsidence Analysis	P								X										P				
Rogers and Hazlegrove Mine Subsidence Evalutaion	P								X										P				
Office of Surface Mining Enforcement w/Subsidence	P				X			X	X								X	M	P				
Harrison Power Mining and Foundation Investigation	P																X	M	P				

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OSM Coal Hollow Road Subsidence Investigation	P								X								X			P			
OSM Penn Hills Home Subsidence Investigation	P								X								X			P			
OSM Frostburg, MD Home Subsidence Investigation	P								X								X			P			
Garrison Subsidence Investigation	P								X								X			P			
Route 30 Plaza East Subsidence Evaluation	P								X								X			P			
Consol Energy Longwall Mining Subsidence	P								X								X	M	P				
Gladden Mine Mitigation Design/Subsidence	C/P			X	X	X			X		X	X		X		X	X	M/P		M		P	P
WVDEP Research and Demonstration Project	P								X		X		X					M						
WVDEP Fisher Run (Posey) Mine Drainage Reclamation	C/P		X		X	X					X		X					M				P	P
WVDEP Godby Branch Water Supply Extension	P		X	X							X	X					X	M					
WVDEP TMDL Water Quality Project	C/P		X	X		X	X					X		X		X							
WVDEP Lefthand Fork Burning Refuse	P		X				X	X			X	X					X	M/P					
WV DOE Mahan Reclamation	P		X								X				X					M			

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WVDEP Majesty Mine Complex Restoration	P		X	X	X	X	X				X	X		X	X	X	X	M					
WVDEP Gauley River Heizer/Manila Water Line	P												X					P					
WVDEP Water Supply Extension Project	P												X					P					
Fishing Run / Gladden Discharge Project	P		X	X	X	X					X	X	X		X	X	X	M					
MAX Environmental Effluent Treatment	P									X		X		X				M					
MD DOE Bureau of Mines Mine Reclamation Open-End	P		X	X	X	X			X			X		X		X	X	M					
MD DOE Bureau of Mines Open End Contract	P					X												M					
Monongahela Properties Geotechnical Investigation	P																X	M					
Powderly Creek Mine Drainage Feasibility Study	C					X					X	X		X		X	X						
Tunnelton Mine Portal Closure for Drainage	C/P		X		X	X					X		X					M				P	P
OSM Surface Coal Mine Fire Abatement	P							X										M					
PADEP Abandoned Mine Reclamation Comp. Plan	P																						
Jandy Refuse Pile Discharge Project	P		X	X		X	X				X	X	X	X		X		M/P					

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Abandoned Mine Storage of Sewer Overflow	P			X		X			X	X		X		X		X	X	M/P					
Mather Coal Refuse Pile Reclamation	P		X		X	X	X	X		X	X	X			X			M/P					
US Steel Abandoned Mine Shaft Closure Re-opening	P				X													M					
Clear Creek Mine Waste Pile with Acid Mine Drainage	C					X				X			X				X						
Island Creek Coal North Branch Mine Projects	P									X							X	M					
Inter-Power of NY Mining Complex Assessment	P											X		X				P					
ANR Coal Company Mining Facility Study	P									X	X		X					P					
OSM Clyde Mine Drainage Project	P			X	X	X			X		X	X	X					M/P					
Maple Creek Mine and Dilworth Mine Construction	P												X					P					
Barton Mine Fire Control Project	P		X					X			X									M			
Bear Run Acid Mine Drainage Treatment Design	C/P		X			X					X					X		M				P	P
Sand Springs Coal Pile Slope Stabilization	P		X	X							X						X	M/P					
Cannelton Industries Mining Mountaintop Removal	P														X			M					

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Ohio Valley Coal Company Mine Seal Closure Designs	C																	M					
BHP Billiton New Mexico Coal Reclamation	P										X											P	
Canterbury Mine Pump Station Design	C/P			X		X					X	X	X	X	X			M/P					
Jonathan Run Stream Restoration Plan	C/P					X					X	X		X	X	X	X	P					
Shelocta Hydrology Evaluation w/Mining Impacts	C/P					X						X						M/P					
PennDOT Acid Rock Mitigation Evaluation	P					X						X		X			X	M					
OSM Hazardous Mine Entries Shaft Inventory	P			X	X				X	X	X		X		X		X	M					
Percy Mine Fire Control Project	P							X										P					
PADEP Ninevah Mine ABD Abatement Project	P			X	X	X			X			X		X		X		M/P					
Paint Branch Mine Passive Treatment Design	C/P		X			X					X							M					P
Bradshaw West Virginia Refuse Pile Reclamation	P		X								X						X			P			
Barnabus West Virginia Refuse Pile Reclamation	P		X	X	X						X									M			
Lowber/Marchand Mine Design Project	P											X		X				P					

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** Use this area to provide specific sections or pages if needed for reference.

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AML and RELATED PROJECT EXPERIENCE MATRIX

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Abatement	P							X										M					
OSM Hogskin Branch Mine Drainage Project	P		X	X	X	X	X		X			X		X		X	X	M/P					
OSM Rabusseau Mine Drainage Evaluation/Design	P		X	X	X	X					X	X	X	X	X	X	X	M/P					
Mark Mine Acid Mine Drainage Abatement	P							X												P			
Turtle Creek Interbasin Transfer of Mine Drainage	P			X	X	X						X		X	X	X	X	M/P					
OSM Argenas Residential Mine Drainage	P			X					X								X	M/P					
Glenn Springs Acid Mine Drainage Treatment Design	P											X	X	X				M					
BethEnergy Acid Mine Drainage Treatment Design	P											X	X	X				M					
VA DMLR Little Short Creek Reclamation	P		X								X					X				P			
VA DMLR Robin Coal Reclamation	P																X			P			
VA DMLR Clifton Mine Reclamation	P																X			P			
PADEP AMR Program Business Plan	P																						
Chartiers Creek Mine Opening and Discharge	P		X	X	X	X						X		X		X		M/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.

Personnel

ABOUT OUR PROJECT MANAGER
THOMAS A. GRAY, PE

Thomas Gray, PE is the Energy and Natural Resources Manager at Tetra Tech. He has a large amount of project experience in West Virginia, having previously managed an engineering office in Charleston. He is a technical expert in mining engineering, mine subsidence, mine reclamation, coal ash disposal and utilization, watershed and ecosystem restoration, acid mine drainage remediation, mine stabilization via grouting and abandoned mine fire mitigation. His long career has included **over 100 mining-related projects**.

Mr. Gray has over 36 years of professional mining experience and is a registered Professional Engineer in West Virginia, Pennsylvania, Virginia, Maryland, and Ohio. He specializes in abandoned mine land reclamation and his project management responsibility has included construction, engineering, regulatory compliance, and research and development. He has also completed mining projects for the West Virginia Department of Environmental Protection including the Owings Mine Complex Acid Mine Drainage Passive Treatment System, which won the **James E. Pitsenbarger Abandoned Mine Land Award**.

He is a member of many industry organizations and is recognized as a Distinguished Member in the Society for Mining, Metallurgy, and Exploration. In addition to authoring over 25 mining-related publications, Mr. Gray has also made presentations at mining conferences around the U.S.

Mr. Gray received a BS degree in Mining Engineering from The Pennsylvania State University and an MBA degree from The University of Pittsburgh.

"I would recommend both Tom and Tetra Tech to anyone considering undertaking an AMD project. The project won the South Fayette Conservation Group a 2008 Western Pennsylvania Environmental Award. The project has also won a 2008 Office of Surface Mining Reclamation Award for the Bureau of Abandoned Mine Reclamation."

Ms. Amy Smith
So. Fayette Conservation Group

"Mr. Gray's work was always of the highest quality and completed within the assigned time frame. I attribute his success to his experience and ability to understand a wide range of issues."

Mr. Michael Garner
Maryland Bureau of Mines

Pennsylvania Department of Environmental Protection

286 Industrial Park Road
Ebensburg, PA 15931-4119
September 3, 2008

Bureau of Abandoned Mine Reclamation 814-472-1800

Tetra Tech NUS, Inc.
661 Andersen Drive
Pittsburgh, PA 15220-2745

Re: Consulting Work

To Whom It May Concern:

This letter is to verify that Thomas Gray, while with his former employer GAI, provided consulting work to PA-DEP, Bureau of Abandoned Mine Reclamation. Most recently, Mr. Gray was involved in a technical evaluation of the potential use of ten mine pools for water storage, with treatment and discharge during low-flow conditions. I was the DEP's project coordinator for this evaluation.

Mr. Gray and his staff were responsive, professional, and completed all work in a timely manner and under budget. All items in the scope of work were fully addressed.

Please contact me at the above phone number if you would like to further discuss this project and Mr. Gray's involvement.

Sincerely,

Pamela J. Milavec, Chief
Environmental Services Section
Cambria Office

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Water Management Administration
Mining Program – Bureau of Mines
160 South Water Street
Frostburg, Maryland 21532

Shari T. Wilson
Secretary

Bob Summers
Deputy Secretary

February 14, 2008

To Whom It May Concern:

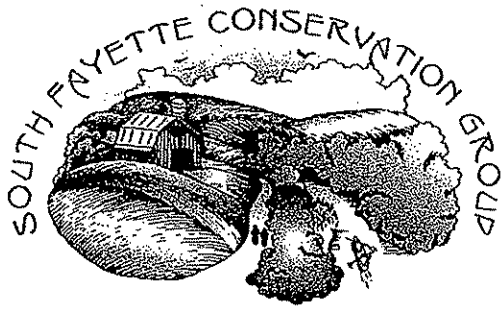
I have worked with Mr. Tom Gray since 2002 as the contract monitor for the Maryland Bureau of Mine's technical service contract and the Chief of the Maryland Abandoned Mine Land Program. During that time, Mr. Gray was assigned tasks to perform technical services related to coal mining and coal mine reclamation. In general, the work consisted of geotechnical evaluations, acid mine drainage evaluations, water supply evaluations and acid mine drainage treatment system enhancements.

Mr. Gray's work was always of the highest quality and completed within the assigned time frame. I attribute his success to his experience and ability to understand a wide range of issues. He communicated effectively by providing work updates and was able to resolve a variety of technical and administrative issues before committing time and resources, maximizing the value of his services to the State. I would recommend him to any person or agency considering contracting for his services. If you have any questions, please feel free to contact me at (301)689-1460 or by email at mgarner@allconet.org.

Sincerely,

Michael P. Garner

Michael P. Garner, Chief
Abandoned Mine Land Program
Maryland Bureau of Mines



September 5, 2008

To whom it may concern,

I want to express my appreciation to both Tom Gray and Tetra Tech NUS, Inc. for their ongoing efforts to design an abandoned mine discharge passive treatment system that the South Fayette Conservation Group will be able to submit for Growing Greener funding in 2009. The meeting of August 28th, held to discuss the design of the settlement ponds with Rich Beam of Pa. DEP BAMR, was insightful and informative. As the result of the meeting, a smart strategy has been decided upon for moving forward with this project.

I would recommend both Tom and Tetra Tech to anyone considering undertaking an AMD project. Tom was the designer of our recently completed Fishing Run Restoration/Maude Mine Reclamation Project. The project won the South Fayette Conservation Group a 2008 Western Pa. Environmental Award. The project has also won a 2008 Office of Surface Mining Reclamation Award for the Bureau of Abandoned Mine Reclamation.

Tom and everyone at Tetra Tech is always very responsive to our needs as we tackle permitting issues, adjacent landowner concerns, grant paperwork requests and the coordination of all project partners. Tetra Tech has also been willing to work with us financially in order to help us achieve our required 15% cost match for the grant funds.

As we continue to tackle the problems of abandoned mine drainage within our township, we look forward to maintaining a strong working relationship with Tom and all of the employees at Tetra Tech NUS, Inc.

Sincerely,

Amy Smith
President, South Fayette Conservation Group

EDUCATION: MBA, Business Administration, University of Pittsburgh, 1977
BS, Mining Engineering, The Pennsylvania State University, 1973

CERTIFICATIONS/ REGISTRATIONS:
Professional Engineer, West Virginia, 10523, 1988
Professional Engineer, Pennsylvania, 26978-E, 1978
Professional Engineer, Maryland, 17048, 1989
Professional Engineer, Virginia, 11628, 1980
Professional Engineer, Ohio, 73686, 2009

PRIOR PROJECT EXPERIENCE:

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

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

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

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

Project Manager; Majorsville Pipeline Alignment Subsidence Study; Majorsville, PA. Project Manager for this preliminary subsidence investigation for a natural gas pipeline for MarkWest Energy. Tetra Tech was tasked with evaluating the potential for subsidence along two proposed natural gas pipeline alignments totaling over 28 miles in length. Relevant mine maps for the area of interest were reviewed. The mine workings which fall under the proposed pipeline alignments include active and abandoned longwall mines as well as a section of abandoned room and pillar mining. Tetra Tech georeferenced the maps and depths of the mine workings and the positions of the proposed pipeline alignments. Profiles of the pipeline alignments were prepared to determine the relative depth from the surface to the mine workings.

Project Manager; West Virginia Division of Environmental Protection Acid Mine Drainage Research and Demonstration/Injection Project; Monongalia County, WV. This research and demonstration project injected coal combustion byproduct based grout into 25 acres of abandoned mine workings to reduce the generation of acid mine drainage 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, the U.S. Department of Energy, Consol Inc. and the Electric Power Research Institute.

Project Manager; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands 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 West Virginia. Prepared construction specifications and construction cost estimate for the closure of nine mine portals.

Project Consultant; West Virginia Division of Environmental Protection Abandoned Mine Reclamation, Charleston, WV. Reclamation design of an abandoned mine site comprising old mine structures, open mine portals, refuse piles and numerous acid mine drainage (AMD) producing discharges. Evaluated water quality and designed a passive AMD treatment system design at the Owings Mine Complex site. Awarded: James E. "Pete" Pitsenbarger Abandoned Mine Land Award North, 1999 West Virginia Reclamation Awards.

Project Manager; West Virginia Division of Environmental Protection Abandoned Mine Workings Injection Project; Monongalia County, WV. This research and demonstration project injected coal combustion byproduct based grout into 25 acres of abandoned mine workings to reduce the generation of acid mine drainage and to reduce subsidence potential. Responsible for R&D investigation, construction plans and specifications, monitoring construction, and preparing a research report. Sponsors included Allegheny Energy, the DOE, Consol Inc. and the Electric Power Research Institute.

Project Advisor; West Virginia Division of Environmental Protection Water Line Extension; Nicholas County, WV. Evaluated construction documents for the Gauley River and Heizer/Manila Creek water line extension projects.

Project Advisor; West Virginia Division of Environmental Protection Water Supply System; Chapmanville, Logan Count, and WV. Designed a water supply system to service approximately 800 residents of the Mill Creek-Isom Community along Godby Branch watershed.

Project Advisor; West Virginia Division of Environmental Protection Water Supply Extension; Logan County, WV. Prepared construction documents for a water supply extension project.

Project Manager; Island Creek Corporation Hydrologic Impact Assessment; Grant County WV. Prepared a cumulative hydrologic impact assessment of the Alpine Number 2 refuse disposal area.

Project Manager; Island Creek Coal Corporation (subsidiary to Occidental Petroleum) Mine Development Services; Bayard, WV. Completed mine development plans, 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.

Project Manager; Indiana County Conservation District Bear Run Phase II, AMD Passive Treatment System; 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; South Fayette Conservation Group Site Grading Plan and Passive Acid Mine Drainage Treatment System; 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 Engineer; Mitchell Power Plant Site Selection Evaluation, Moundsville, WV. Completed a site selection evaluation of a new solid waste landfill at a coal-fired electric generating facility. The site was underlain by coal that had been deep mined using room and pillar mining.

Project Manager; Cannelton Industries Surface Mining Equipment Time and Motion Studies; Charleston, WV. Conducted time and motion studies for surface mining equipment at a mountain top removal operation, including draglines, off road trucks and hydraulic excavators.

Project Manager; West Virginia Division of Highways, PennDOT, and Pennsylvania Turnpike Commission Mineral Reserves Appraisal Reports; WV and PA. Provided appraisal reports of mineral reserves related to highway right of way acquisition, including expert witness testimony.

Project Manager; Island Creek Coal Corporation (subsidiary to Occidental Petroleum) Structural Integrity Evaluation; 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; Mettiki Coal Corporation Construction Management; Mt. Storm, WV. Provided construction management support for the construction of a new coal handling and storage facility at the Mt. Storm power plant and a three mile coal haul road.

Project Manager; Cannelton Industries Mine Permitting and Environmental Compliance Evaluation; Charleston, WV. Evaluated permit and environmental compliance of a subcontracted surface mine operator and preparation of an expert witness legal report.

Project Engineer; BethEnergy Mines 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 Engineer; ANR Coal Company Mine Complex 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.

Project Manager; Ohio Valley Coal Company Mine Seal Designs. 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; Office of Surface Mining Dolph Mine Fire; 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; PADER Percy Mine Fire Control Project; 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.

Project Manager; South Fayette Conservation Group in association with PADEP Deep Mine Discharge Investigation; 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.

Project Manager; Maryland Department of the Environment Bureau of Mines Open-End Mining Contract; Frostburg, MD. Managed an open end contract to provide technical assistance in mining 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; Paint Creek Watershed Association in association with PADEP Jandy Coal Refuse Disposal Site AMD Investigation; 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.

Project Manager; Maryland Department of the Environment, Bureau of Mines Open-End Hydrogeology Contract; 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.

Project Manager; Chartiers Nature Conservancy in association with PADEP Deep Mine Discharge Evaluation; 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.

Project Manager; U.S. Army Corps of Engineers, Pittsburgh District Mine Abatement Feasibility Study, 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.

Project Manager; BethEnergy Mines Acid Mine Drainage Treatment Design; 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 for the final design and construction oversight of a pilot test treatment system.

Project Manager; Mettiki Coal Company Mine Drainage Study; Western MD. Completed a mine drainage study to determine the feasibility of eliminating acid mine drainage (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.

PUBLICATIONS:

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 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 Gray, T. A. "Coal Ash Utilization at Coal Mines." Presented at the West Virginia Mining and Reclamation Association Meeting, February 14, 1997.

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.

Richard E. Gray, PG
Deputy Project Manager

EDUCATION: BS, Geological Engineering, Carnegie Mellon University

CERTIFICATIONS/ REGISTRATIONS:
Professional Geologist, Pennsylvania
Professional Geologist, Virginia
Professional Geologist, Delaware
Professional Geologist, North Carolina
Professional Geologist, South Carolina
Professional Geologist, Florida
Professional Geologist, Indiana
Professional Geologist, Kentucky
Professional Geologist, Illinois
Professional Geologist, Alabama
Professional Geologist, California
Professional Geologist, Wyoming

PRIOR PROJECT EXPERIENCE:

Geologist; WVDEP Omega Mine Injection Program to Control and Prevent Subsidence and Acid Mine Drainage; WV. Twenty-six acres of the mine were filled with coal combustion products to control the formation of acid mine drainage and prevent subsidence – West Virginia Division of Environmental Protection.

Geologist; Coal Mine Subsidence Projects; Canada. Mr. Gray has worked on coal mine subsidence at several locations in Canada.

Geologist; Ebasco Services Subsidence Evaluation; Ludington, MI. Mr. Gray performed an evaluation of rock deformation and resultant subsidence due to brine extraction.

Director; U.S. Bureau of Mines Subsidence Study; Bruceton, PA. Mr. Gray performed a study of surface subsidence over the mined Pittsburgh Coalbed. This project involved the collection and analysis of over 400 cases of subsidence due to abandoned mines.

Director; Appalachian Regional Commission State of the Art Study on Subsidence Control; Washington, DC. This project involved developing a summary of current knowledge on coal mine subsidence and stabilization measures for subsidence control.

Director; U.S. Bureau of Mines Survey of Ground Surface Conditions Affecting Structural Response to Subsidence; Minneapolis, MN. Mr. Gray performed an investigation of the effect of near surface soil and rock on coal mine subsidence damage to structures.

Manager; Indianapolis Power & Light Company and electric Power Research Institute Abandoned Deep Mine Subsidence Abatement Project. Manager of demonstration project on the injection of fixated scrubber sludge into abandoned deep mine to abate surface subsidence – Indianapolis Power & Light Co. and Electric Power Research Institute.

Guest Lecturer; University of Missouri, Rolla Subsidence Engineering Courses. Mr. Gray has been a key guest lecturer in several short courses on subsidence engineering conducted by the University of Missouri, Rolla.

Geologist; Tonkin and Taylor Subsidence Study; Whangarei, New Zealand. Mr. Gray performed a subsidence study and made recommendations on land use zoning for this project in New Zealand.

Geologist; Sullivan-Hayes Subsidence Evaluation and Stabilization Program; Kansas City, MO and Denver, CO. Mr. Gray performed an evaluation of subsidence potential at an underground limestone mine and also the design of a stabilization program for the support of a large mall.

Geologist; Standard Lime and Cement Company Subsidence Analysis; Martinsburg, WV. Mr. Gray performed an analysis of subsidence potential due to limestone dissolution.

Geologist; Woods, Rogers and Hazlegrove Mine Subsidence Evaluation; Saltville, VA. Mr. Gray performed an evaluation of subsidence potential from gypsum mining.

Project Manager; Office of Surface Mining Reclamation and Enforcement Contracts Including Subsidence; Various Locations. Mr. Gray served as the Project Manager of two Office of Surface Mining Reclamation and Enforcement contracts in which 55 separate studies were conducted on mine drainage, unstable refuse banks, subsidence, shafts, mine fires, and landslides.

Geologist; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Fisher Run Portal Closure; Weston, WV. Project Manager for the investigation and design for the closure of seven mine portals on private property. Prepared construction specifications and construction cost estimate.

Geologist; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Tunnelton Mine Portal Closure Design for Acid Mine Drainage; Tunnelton, WV. Project Manager for the investigation and design for the closure of two mine portals on separate property parcels. Prepared construction specifications and construction cost estimate.

Geologist; WVDEP Reclamation Projects; WV. Mr. Gray participated in four reclamation projects involving large, unstable coal refuse piles for the WVDEP in Omar, Kimball, Vivian, and Summerlee, WV.

Author; Papers, Presentations and Reports. Mr. Gray has served as an author or co-author for a variety of mining-related publications and presentations including:

- "Highwall Elimination and Return to Approximate Original Contour as Required in the Surface Mining Control and Reclamation Act of 1977"
- "Subsidence Failure Modes Presentation for the NRC"
- "Mitigating Losses from Land Subsidence in the U.S."
- "Fires in Abandoned Coal Mines"
- "Mine Closure, Sealing and Abandonment"
- "Slope Stability in the Appalachian Plateau of Pennsylvania and West Virginia"
- "Making the Grade in Coal Refuse Disposal"
- "Processes of Colluvial Slope Development"
- "Indicators of Coal Refuse Embankment Stability"

Project Manager; West Virginia Department of Environmental Protection Mine Projects; Various Locations in WV. Mr. Gray served as the Project Manager for a variety of mining-related projects for the West Virginia Department of Environmental Protection in the 1980s and 1990s. Projects included mine drainage, unstable refuse banks, abandoned mine land reclamation, subsidence, and mine fires.

Geologist; Allegheny Power System Harrison Power Station Project; Haywood, WV. Mr. Gray performed a mining and foundation investigation at the Harrison Power Station.

Dave Hallman, PE, PG
Project Advisor

EDUCATION: BS, Geological Engineering, Colorado School of Mines, 1983

CERTIFICATIONS/ REGISTRATIONS:
Professional Engineer, Missouri, E-26685, 1994
Professional Engineer, Texas, 90421, 2002
Professional Engineer, Colorado, 26076, 1989
Professional Engineer, Wyoming, PE-9495, 2002
Professional Engineer, Idaho, 8350, 1996
Professional Engineer, Alaska, CE-8086, 1990
Professional Geologist, Wyoming, PG-3536, 2004

TRAINING:
OSHA 1910.120 40-Hour HAZWOPER Training
OSHA Confined Space Entry
MSHA Part 48 Underground Mine Safety and Health Training

PRIOR PROJECT EXPERIENCE:

Principal Engineer; Coal Mine Subsidence Evaluation and Mitigation Value Engineering; Nelsonville, OH. Principal Engineer responsible for value engineering to identify alternative means and methods to reduce the cost of subsidence mitigation efforts for historic underground room and pillar coal mines underlying 8.5 miles of 4-lane roadway. The work was conducted for the Ohio Department of Transportation in conjunction with the $200 million Highway 33 Nelsonville Bypass project funded as part of the economic stimulus plan.

Principal Engineer; Coal and Clay Mine Subsidence Investigations, Golden and Colorado Springs; CO. Principal Engineer responsible for project management for geotechnical investigations for a demonstration project on the use of geophysical imaging techniques for mine subsidence evaluations for the Colorado Department of Natural Resources, Division of Reclamation, Mines and Safety. The sites targeted for the initial investigations include the Colorado School of Mines campus and a residential neighborhood in Colorado Springs.

Principal Engineer; Coal Mine Subsidence Evaluation and Mitigation; Rock Springs, Wyoming. Principal Engineer responsible for project management, coordination and senior geotechnical review for multi-disciplinary technical teams evaluating and mitigating subsidence risk over extensive historic underground room and pillar coal mines in developed and undeveloped areas within the City of Rock Springs as initial task orders under a multi-year state-wide ID/IQ contract for subsidence mitigation with the Wyoming Department of Environmental Quality, Abandoned Mine Land Division. The project included the use of state-of-the-art geophysical imaging to provide better definition of the subsidence hazards than traditional methods based on a grid drilling approach. Required extensive use of GIS systems to process and assimilate large volumes of existing data, monitoring of active ground movements and participation in public information meetings.

Technical Specialist; Sunrise Mine Subsidence Potential/Reclamation Measure Evaluations; Guernsey, WY. Technical Specialist responsible for evaluation of subsidence potential and reclamation measures of large subsidence features associated with block caving practices at this historic iron mine. Assessed landslide-induced wave action associated with potential failure of a large open pit filled with water. Developed automated slope monitoring system to provide warning of impending failure(s) to protect potential downstream inundation zones.

Principal Engineer; Coal Mine Fire Investigation; Rifle CO. Principal Engineer responsible for project management and investigations to characterize a mine fire burning in a historic underground coal mine. Selected by the Colorado Department of Natural Resources, Division of Reclamation, Mines and Safety as part of a project team to characterize the coal mine workings and determine the relationships that exist between the areas of subsidence, the burning coal seam, and the previously placed grout. The program

includes utilizing non-invasive geophysical methods to accomplish the mine characterization as well as Health and Safety protocols, Thermal Imagery, Smoke/Inert Gas Tracer Study, Surveying, GIS Implementation and Coal Mine Fire evaluation.

Senior Geotechnical Engineer; Seismic Hazard Assessment/Mitigation; El Mochito, Honduras. As Senior Geotechnical Engineer, evaluated seismic hazards and developed design ground motions for this copper-zinc mine using current state-of-the-art approaches to update previous studies.

Senior Geotechnical Engineer; Tumiri Norte Project Seismic Hazard Evaluations; Southern Peru. Senior Geotechnical Engineer responsible for probabilistic and deterministic seismic hazard evaluations for mine tailings disposal facilities in southwestern Peru. Performed detailed review of historic seismicity and regional seismotectonics. Presented recommendations for seismic design parameters and methodology to be adopted for engineering analyses.

Geotechnical Engineer; Ten-Mile Pass Limestone Quarry Rock Slope Stability Assessment, Soda Springs, ID. As the Project Geotechnical Engineer, performed a preliminary assessment of rock slope stability for this proposed limestone quarry as part of an overall mine plan evaluation. Subsequent access road development included rock slope excavations, which exceeded recommended slope angles and triggered slope failures necessitating remedial design.

Geotechnical Engineer; Pueblo Viejo Mine Rock Slope Stability Evaluation; Dominican Republic. Geotechnical Engineer responsible for evaluation of rock slope stability for major expansion of the open pit gold mining operation in support of privatization studies of the current operations. Preliminary designs include ultimate pit dimensions of roughly 2.5 kilometers by 1.5 kilometers with a maximum depth of 330 meters extending to sea level. Slope stability assessments included evaluation of blasting practices and potential impacts of extensive deeply weathered rock masses and existing slope failures. Duties included seismic hazard evaluation in the complex tectonic regime associated with the North American-Caribbean plate boundary and major strike-slip faulting and assessment of tailings dam stability.

Geotechnical Engineer; Minas Santa Rosa Rock Slope Stability Evaluation; Central Panama. As Geotechnical Engineer, conducted an evaluation of rock slope stability for expansion of the open pit mining operations. Evaluated extensively weathered rock and laterite soils in the upper portions of the pit walls and existing slope failures. Evaluated stability of waste rock dumps, which exhibited signs of distress and movement, and the potential impact of heap leach facilities.

Project Engineer; Florida Canyon Mine Rock Slope Stability Evaluation; Winnemucca, NV. Project Engineer responsible for evaluating rock slope stability at this large operating open pit gold mine to determine safe slope angles for continued pit expansion. Analyses included assessment of weak, shattered rock masses.

Project Manager; Silver Mine Bankable Feasibility Design, San Bartolome Project; Southern Bolivia. Project Manager responsible for engineering design for bankable feasibility design for a proposed 27M tonne silver mine in the historic Potosi Mining District of Bolivia. Facility designs include a staged 86–meter high cyclone sand tailings dam, a 12M tonne sand heap facility, and a 5M tonne tailings slimes disposal facility. Innovative design concepts incorporated into the project include the use of the heap to form, in part, the embankment for the slimes disposal dam. Directed/supervised multidisciplinary design team and coordinated with OEM contractor and owner.

Senior Geotechnical Engineer; Goldstrike Mine Leach Pad Closure Design; Elko, NV. As Senior Geotechnical Engineer, assisted with closure design for the AA Heap Leach Pad. Responsible for toe drain design and solution management to separate drain down flows from different portions of heap following closure.

Allan R. Berenbrok, PE
Project Engineer

EDUCATION: MS, Systems Management, University of Southern California, 1984
BS, Civil Engineering, The Virginia Military Institute, 1980

CERTIFICATIONS/ REGISTRATIONS: Professional Engineer, Pennsylvania, 037262-E, 1988

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training
OSHA 1910.120 8-Hour Annual Refresher Training

PRIOR PROJECT EXPERIENCE:

Project Engineer; Majorsville Pipeline Alignment Subsidence Study; Majorsville, PA. Project Engineer for this preliminary subsidence investigation for a natural gas pipeline for MarkWest Energy. Tetra Tech was tasked with evaluating the potential for subsidence along two proposed natural gas pipeline alignments totaling over 28 miles in length. Relevant mine maps for the area of interest were reviewed. The mine workings which fall under the proposed pipeline alignments include active and abandoned longwall mines as well as a section of abandoned room and pillar mining. Tetra Tech georeferenced the maps and depths of the mine workings and the positions of the proposed pipeline alignments. Profiles of the pipeline alignments were prepared to determine the relative depth from the surface to the mine workings.

Lead Design Engineer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Fisher Run Portal Closure; Weston, WV. Lead Design Engineer for the investigation and design for the closure of seven mine portals on private property. Prepared construction specifications and construction cost estimate.

Lead Design Engineer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Tunnelton Mine Portal Closure Design for Acid Mine Drainage; Tunnelton, WV. Lead Design Engineer for the investigation and design for the closure of two mine portals on separate property parcels. Prepared construction specifications and construction cost estimate.

Lead Design Engineer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Paint Branch Mine Project; Kanawha, WV. Lead Design Engineer providing design services and the final preparation of construction drawings and specifications to install splash pads and metal bat gates on three abandoned mine portals and to remove approximately 48 abandoned bridge piers in Paint Branch.

Lead Design Engineer; Indiana County Conservation District Bear Run Phase II Acid Mine Drainage Passive Treatment System; Indiana County, PA. Lead Design Engineer for the design of a passive acid mine drainage 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.

Lead Design Engineer; Gladden Mine Reclamation; South Fayette, PA. Preparation of a site grading plan and passive acid mine drainage 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 performance of an HEC – RAS study to determine the effect of the construction of the treatment ponds to the floodway of Millers Run.

Matthew D. Furniss, EIT

Project Engineer

EDUCATION: MS, Mining and Minerals Engineering, Virginia Tech, 2009
BS, Mining and Minerals Engineering, Virginia Tech, 2007

CERTIFICATIONS/ REGISTRATIONS: Engineer-In-Training, 2007

PRIOR PROJECT EXPERIENCE:

Project Engineer; Majorsville Pipeline Alignment Subsidence Study; Majorsville, PA. Project Engineer for this preliminary subsidence investigation for a natural gas pipeline for MarkWest Energy. Tetra Tech was tasked with evaluating the potential for subsidence along two proposed natural gas pipeline alignments totaling over 28 miles in length. Relevant mine maps for the area of interest were reviewed. The mine workings which fall under the proposed pipeline alignments include active and abandoned longwall mines as well as a section of abandoned room and pillar mining. Tetra Tech georeferenced the maps and depths of the mine workings and the positions of the proposed pipeline alignments. Profiles of the pipeline alignments were prepared to determine the relative depth from the surface to the mine workings.

Project Engineer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Fisher Run Portal Closure; Weston, WV. Lead Design Engineer for the investigation and design for the closure of seven mine portals on private property. Prepared construction specifications and construction cost estimate.

Project Engineer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Tunnelton Mine Portal Closure Design for Acid Mine Drainage; Tunnelton, WV. Lead Design Engineer for the investigation and design for the closure of two mine portals on separate property parcels. Prepared construction specifications and construction cost estimate.

Project Engineer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Paint Branch Mine Project; Kanawha, WV. Final preparation of construction drawings and specifications to install splash pads and metal bat gates on three abandoned mine portals and to remove approximately 48 abandoned bridge piers in Paint Branch.

Project Engineer; Indiana County Conservation District Bear Run Phase II Acid Mine Drainage (AMD) Passive Treatment System. Design of a passive AMD treatment system (launder weir channel, two wetlands, and a pond). Preparation of construction drawings, specifications, and cost estimate.

Project Engineer; South Fayette Conservation Group Gladden Mine Discharge Passive Treatment System (in association with PADEP); South Fayette Township, PA. Assisted with final report on the background, new conceptual design, and final design of the passive treatment system design for the Gladden Mine Discharge. Cost estimate and final construction specifications were prepared.

Project Engineer; South Fayette Conservation Group Fishing Run Stream Sealing (in association with PADEP); South Fayette Township, PA. Investigation of potential stream flows into the Gladden Mine. Identification of four stream channels losing flow through seep and apparent sinkhole subsidence events. Preparation of surface/mine map overlays.

Project Engineer; BHP Billiton New Mexico Coal Reclamation Projects. Prepared cut/fill regrade calculations and diagrams for reclamation.

Project Engineer; BHP Billiton New Mexico Coal Feasibility and Cost Analyses. Prepared feasibility and cost analyses for mine expansion road relocation and construction.

Biff D. Cummings, PE
Project Engineer

EDUCATION: BS, Civil Engineering, The Pennsylvania State University, 1978

CERTIFICATIONS/ REGISTRATIONS:
Professional Engineer, West Virginia, 015871, 2004
Professional Engineer, Pennsylvania, PE 033238 E, 1984
Professional Engineer, Ohio, E-57675, 1994
Professional Engineer, Indiana, PE 10403586, 2004
Professional Engineer, Illinois, 062.059306, 2006
Professional Engineer, Alabama, 21197-E, 2005
National Council of Examiners for Engineers and Surveyors, 11655, 1993

TRAINING:
OSHA 1910.120 40-Hour HAZWOPER Training
OSHA 1910.120 8-Hour Annual Refresher Training
OSHA 1910.120 8-Hour Supervisory Training

PRIOR PROJECT EXPERIENCE:

Project Manager; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Tunnelton and Weston Projects; 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 West Virginia. Prepared construction specifications and construction cost estimate for the closure of nine mine portals.

Project Manager; AEP Southern Ohio Coal Company Barnes Mine Subsidence/Landslide Litigation; Fairmont, WV. Managed this landslide/mine subsidence litigation case. It was contended by a homeowner that mine subsidence led to a landslide that was damaging his home and the coal company hired ICF Kaiser to support its defense. Mr. Cummings developed plans for the installation of slope monitors, supervised long-term data collection, analyzed data, evaluated seasonal hydrogeologic conditions, and provided documentation for use in court to defend the coal company.

Project Engineer; Office of Surface Mining Various Subsidence Projects; Various Locations in PA and MD. Mr. Cummings served as a Project Engineer on several home subsidence projects in Pennsylvania and Maryland for the Office of Surface Mining. These projects were located in Penn Hills and Bridgeville, Pennsylvania and Frostburg, Maryland.

Project Geotechnical Engineer; Union Pacific Railroad Company Subsidence and Geotechnical Evaluation; Long Beach, CA Provided geotechnical evaluation and technical design review of remedial activities at the 31-acre Toyota Parcel. Established parameters for construction of a cap and pavement over the site, which consisted of swamps containing oil field production waste. Also developed an investigation program consisting of cone penetrometer, standard test boring and geotechnical test to evaluate potential the potential subsidence at the site due to the increase in loading cause by site grading operations. Evaluated material stabilization and oil drainage collection systems.

Project Manager/Senior Engineer; Parkway Center Mall Subsidence Investigation and Foundation Rehabilitation; Pittsburgh, PA. Managed the investigation, design, and construction program for the rehabilitation of the foundation system of this $30 million shopping mall including deep mine grouting. The mall was settling leading to severe structural damage due to differential settlement and subsidence. For this project, Mr. Cummings developed subsurface exploration plans, analyzed the data obtained, designed methods to support the mall without restricting business operations, and managed construction oversight of the foundation correction methods.

Senior Project Manager; Babst, Calland, Clements and Zomnir Subsidence Investigation and

Expert Report. Prepared an expert report regarding design and construction of clay lined industrial waste landfill cells, and the appropriateness and effectiveness of remedial actions preformed at the site under the NCP. Also investigated the causes of subsidence in a drainage pipe located beneath the cells.

Project Engineer; Barnabus Refuse Piles Mine Sealing; WV. Provide sealing of approximately five (5) deep mine openings and development of reclamation plans. Site contained unstable, eroding refuse piles and open abandoned portals with attendant drainage. Provide detailed field reconnaissance, collection and laboratory analysis of refuse and soil samples, ground control survey, reclamation designs, hydrologic and hydraulic analyses, designs for wet and dry mine seals, evaluation of areas as direct-seeded growth medium because of limited borrow areas.

Project Engineer; Bradshaw Coal Refuse Pile Reclamation; WV. Performed reclamation of four (4) abandoned refuse piles. Provided Aerial photography, topographic mapping, surficial and subsurface investigations, laboratory testing, design engineering, construction drawings, technical specifications, construction cost estimates and construction monitoring.

Project Engineer; Mark Mine Acid Mine Drainage Abatement Project; Kermit, WV. Mr. Cummings served as a Project Engineer on this acid mine drainage project. He performed the mine seal and design.

Project Manager; Bayer Corporation Remedial Action Work Plan for the South Landfill; New Martinsville, WV. Prepared the design and Remedial Action Work Plan (RAWP) for the closure of the South Landfill (SWMU Group A) at Bayer Corporation's New Martinville, West Virginia Facility. Prepared a landfill cap design to mitigation filtration; designed a stormwater management and sedimentation and erosion control facilities, and; prepared the RAWP for submission to U.S. EPA and the West Virginia Division of Environmental Protection. The approximately 5-acre landfill contained wastes from past disposal operations at the plant system that, based on previous investigation, were impacting groundwater. Provided a cap design consisting of a multi-layer system utilizing a geomembrane, and geocomposite drainage materials.

Project Engineer; West Virginia Department of Energy Mahan Reclamation Project; WV. Mr. Cummings served as a Project Engineer for this reclamation project. He performed gob pile reclamation, geotechnical, and design services.

Project Engineer; Virginia Department of Mine Lands and Reclamation Projects; VA. Mr. Cummings served as a Project Engineer on a variety of reclamation projects for the Commonwealth of Virginia, providing gob pile reclamation, geotechnical, mine seal, and design services. His projects for the Virginia DMLR included the: Clifton Reclamation project, Little Short Creek Reclamation project, and the Robin Coal Reclamation project.

Senior Project Manager; Hobet Mining Company Pine Creek Upstream Coal Tailings Impoundment Expansion. Mr. Cummings evaluated and designed a 165-foot-high expansion of an upstream constructed coal tailings impoundment to store an additional 18 million tons of waste material. Provided subsurface investigation and piezometer installation, physical testing including, static and cyclic triaxial shear tests, hydrologic and hydraulic evaluations of drainage facilities, a seismic evaluation and liquefaction analysis, consolidation pressure analysis, stability analysis, and development of plans and specifications.

Senior Project Manager; Barton Mine Fire; Barton, MD. Design of the abatement plan for a fire within an existing deep mine using a cutoff trench. The site is located approximately 2.5 miles east of Barton, Maryland. The area was initially strip mined approximately 6,000 feet along the outcrop with the deep mine entries developed in the coal seam at the base of the highwall. The mine fire has extended about 200 feet into the deep mine at various locations along the strip mine highwall. Present preliminary designs and associated quantities and cost estimates for comment by MD Bureau of Mines personnel. Develop final construction design drawings and technical specifications. Prepare final construction cost estimates.

Michael Byle, PE
Project Engineer

EDUCATION: MS, Civil Engineering, The University of Michigan, 1981
BS, Civil Engineering, The University of Michigan, 1978

CERTIFICATIONS/ REGISTRATIONS:
Professional Engineer, Pennsylvania, Number 43570, 1992
Professional Engineer, Virginia, Number 019814, 1989
Professional Engineer, Maryland, Number 18215, 1990
Professional Engineer, Minnesota, Number 45019, 2006
Professional Engineer, New Jersey, Number GE46036, 2006
Professional Engineer, Delaware, Number 9503, 1993
Professional Engineer, New York, Number 086163, 2008
Professional Engineer, Florida, Number PE68109, 2008
Professional Engineer, New Hampshire, Number 12773, 2009
Professional Engineer, Colorado, Number 20646, 1983

TRAINING: OSHA 1910.120 40-Hour Health and Safety Training

PRIOR PROJECT EXPERIENCE:

Project Manager; U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, Bills/Keefe Mine Subsidence; Cambria County, PA. Project Manager responsible for the remedial design to arrest subsidence of two dwellings into an abandoned mine drift located between the two houses and about 45 feet below the ground surface. The remediation consisted of creating check dams of stiff concrete within the mine drift and filling the drift between them with a low-strength grout. Densified the disturbed soils above the drift with compaction grouting. Prepared the design and specifications for this work and provided construction-phase consultation.

Project Manager; Mine Subsidence Evaluation; Aspen, CO. Project Manager responsible for geologic, slope stability, and mine subsidence evaluation for hotel development at the base of Aspen Mountain. The project involved evaluation of stability of mine waste slopes, interpretation of mine maps, and evaluation of subsidence potential due to abandoned 19th century silver mines, as well as geologic hazard evaluation and design of stabilization measures. Prepared studies and reports and specifications for slope stability, mine hazard mitigation, and building foundations.

Lead Geotechnical Engineer; Pennsylvania Department of Transportation, District 4-0, I-81 Section AIR Mine Subsidence Investigation; Luzerne County, PA. Discipline Manager responsible for geotechnical studies and mine subsidence investigation for rehabilitation of an existing highway interchange and construction of a proposed new roadway. The site lies in the Northern Anthracite Coal region of Pennsylvania and surface and subsurface coal mining had historically occurred in the area for approximately 150 years. Directed research and analysis of mining maps, reports, and other historical information concerning surface and subsurface coal mining in the project area. Responsible for completing geotechnical exploration for roadways and structures and developing foundations to support proposed structures and mitigate the affects of previous mining.

Consultant; Confidential Client, Subsidence Mitigation for a Cosmetics Plant; Sao Paulo, Brazil. Specialty Consultant serving on a review board with Brazilian experts to evaluate the cause and determine the remedy for settlements identified during construction of a high-tech manufacturing, warehousing, and distribution facility. Settlements were attributed to ground loss due to soil migration into limestone solution features more than 50 meters deep. Recommended the stabilization of the subsidence using limited-mobility grouting and jet grouting. Prepared specification for the grouting method. Consulted with Brazilian grouting contractor on techniques and equipment. Observed construction and prepared recommendations to improve the safety and efficiency of the work.

Ernest F. Giovannitti, PE

Project Advisor

EDUCATION: MS, Sanitary Engineering, The Pennsylvania State University, 1976
BS, Civil Engineering, The University of Pittsburgh, 1964

CERTIFICATIONS/ REGISTRATIONS: Professional Engineer, Pennsylvania, PE014032E
Professional Engineer, Maryland, 31658

PRIOR PROJECT EXPERIENCE:

Project Engineer; Stoller Chemical Site Evaluation; Charleston, SC. Mr. Giovannitti performed the engineering evaluation for a contaminated restoration plan on the Stoller Chemical site located in Charleston, South Carolina.

Project Engineer/Independent Subcontractor; Various Mine Restoration Projects; Various Locations. Mr. Giovannitti served as a subcontractor to perform work on a variety of mine restoration projects.

Project Engineer; Clean Ocean and Shore Trust Evaluation for Mine Reclamation. Mr. Giovannitti performed an engineering evaluation of the use of dredged material and coal ash for a mine reclamation for the Clean Ocean and Shore Trust.

Project Engineer; Mine Discharge Feasibility Study. Mr. Giovannitti performed an engineering evaluation of the feasibility of using mine discharges to generate electrical energy.

Project Engineer; Upper Little Conemaugh River Evaluation; PA. Mr. Giovannitti performed an engineering evaluation and watershed restoration plan for this river located in Pennsylvania.

Project Engineer; McDonald Mine Discharge Evaluation; Frostburg, MD. Mr. Giovannitti performed an engineering evaluation of discharge from the McDonald mine located in Frostburg, Maryland.

PADEP Director of Abandoned Mine Reclamation; Pennsylvania Comprehensive Plan for Abandoned Mine Reclamation; PA. While employed at the Pennsylvania Department of Environmental Protection, Mr. Giovannitti created this comprehensive plan, which provides a framework for organization reclamation in the state. It provides for coordinating among those involved in reclamation activities, for prioritizing expenditures and for decision-making. It also includes a process for developing restoration plans on a watershed basis, method for selecting projects based on costs and benefits and recognizes that partnering is the only means for achieving comprehensive solutions to abandoned mine land problems.

Project Engineer; Clearfield County Mine Restoration Research and Demonstration "Laboratory." Several important and innovative mine restoration techniques resulted from this effort including: The beneficial use of high alkalinity coal ash as a fill material for reclaiming abandoned surface mines; The development of an artificial soil using waste products from a paper mill and leather tannery; and the beneficial use of dredged material combined with coal ash and waste lime products to produce a fill material for reclaiming abandoned surface and underground mines.

PADEP Director of Abandoned Mine Reclamation; Abandoned Mine Reclamation Program Business Plan; PA. While at the Pennsylvania Department of Environmental Protection, Mr. Giovannitti developed this plan to identify the Bureau of Mining and Reclamation's business practices, solicited customer needs, and established strategic goals and objectives.

PADEP Director of Abandoned Mine Reclamation; Investigation of use of Beneficial Materials for Mine Reclamation; PA. While at the Pennsylvania Department of Environmental Protection, Mr. Giovannitti developed this initiative to seek companies and contractors to determine that abandoned mine lands can be reclaimed at no cost or reduced costs using materials (i.e. fly ash, river dredge, biosolids, air pollution control by-products) discarded by others.

PADEP Director of Abandoned Mine Reclamation; Research of Alternative Means for Treating Acid Mine Drainage; PA. While at the Pennsylvania Department of Environmental Protection, Mr. Giovannitti researched new means to treat acid water including the pyrolucite process and enhanced limestone dissolution with carbon dioxide.

PADEP Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management; Program Guidance Manual Development; PA. While at the Pennsylvania Department of Environmental Resources, Mr. Giovannitti established a formal, written mechanism for communicating program policies and procedures to the staff responsible for implementation.

PADEP Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management; Comprehensive Management Information System; PA. While at the Pennsylvania Department of Environmental Resources, Mr. Giovannitti developed this system used by supervisors to manage their workload, by management to conduct program evaluations, and by raters to measure individual performance. The system also produces reports to support federal grant requirements.

PADEP Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management; Program Planning Process and Development of Annual Program Plans; PA. While at the Pennsylvania Department of Environmental Resources, Mr. Giovannitti initiated a program planning process and developed annual program plans. This important program element included a compilation of mandated work, an analysis of workload, the prioritization of work, reconciliation between the mandated workload, and the available resources and listing of work that cannot be done.

PADEP Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management; Surface Mining Permit Policy; PA. While at the Pennsylvania Department of Environmental Resources, Mr. Giovannitti established a formal policy to issue surface mining permits within 180 days.

PADEP Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management; Development of a Complete Approach to Mine Permitting; PA. While at the Pennsylvania Department of Environmental Resources, Mr. Giovannitti developed a complete approach to mine permitting. Mining permits include a water quality evaluation consistent with the water quality requirements; a stream encroachment and wetlands evaluation consistent with the requirements of those programs; and a residual waste evaluation where fly ash is disposed into surface mines.

PADEP Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management; Erosion and Sedimentation Control Program; PA. While at the Pennsylvania Department of Environmental Resources, Mr. Giovannitti developed this program including regulations and implementation mechanisms to control the water pollution problems caused by accelerated erosion and sedimentation.

PADEP Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management; NPDES Program; PA. While at the Pennsylvania Department of Environmental Resources, Mr. Giovannitti developed the necessary regulations, procedures, budgets, grant application, and program description to obtain delegation of the NPDES program for the state of Pennsylvania. The Memorandum of Agreement with the Environmental Protection Agency was also negotiated.

Anthony P. Klimek, PE
Project Engineer

EDUCATION: MS, Business Administration, Robert Morris College, 1984
BS, Civil Engineering Technology, University of Pittsburgh, 1980

CERTIFICATIONS/ REGISTRATIONS: Professional Engineer, West Virginia, 10166, 1987
Professional Engineer, Pennsylvania, PE033817E
Professional Engineer, Kentucky, 21633, 2001
Professional Engineer, Ohio, E-58057, 1993
Professional Engineer, North Carolina, 031772, 2001

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training
OSHA 1910.120 8-Hour Annual Refresher Training

PRIOR PROJECT EXPERIENCE:

Project Investigator; National Coal Association/American Mining Congress Surface Mining Regulatory Impact Study; Nationwide. Principal investigator on a regulatory impact study for the National Coal Association/American Mining Congress Joint Committee on Surface Mining Regulations. This study was conducted in response to regulations proposed by the Office of Surface Mining. Mr. Klimek assisted in the development of a nationwide database of underground coal mines throughout the coalfields of the United States that was used to identify "typical" mines. The regulatory impact of the proposed rule on the "typical" mines was then determined and extrapolated to the nation. Mr. Klimek's responsibilities included gathering data from "typical" mines, developing a procedure to calculate the impact of the proposed rule on the mines, and extrapolating this impact from the mines to the U.S. coal industry. Mr. Klimek co-authored a paper describing the Phase I results of this study.

Project Engineer; Ohio Department of Natural Resources Abandoned Mine Land Remediation; Interstate *70/77* Industrial Park, Guernsey County, OH. Project engineer for analysis and design of an abandoned mine land project that consisted of preparing a grading and drainage control plan to remediate an abandoned surface mine area and convert it into an industrial park. Project included preparation of plans and specifications.

Project Engineer; Ohio Department of Natural Resources Abandoned Mine Land Remediation Measures for Gob Pile Area and Acid Mine Drainage; Belmont County, OH. Designed remedial measures for an abandoned mine land (AML) site in Barton, Belmont County, Ohio. Project included both a large gob pile area and an acid mine drainage problem. A regrading plan was developed for the gob pile. The regrading plan required geotechnical stability analysis and drainage control design. The acid mine drainage problem included design of permeable mine drains, provision of a temporary treatment facility for acid mine drainage during construction, relocation of a major stream, and preparation of the necessary permit applications. Project included preparation of design reports, plans, and specifications and construction cost estimates.

Project Engineer; Cravat Coal Company Surface Mine Permit Application; Cross-Creek Mine, Washington County, PA. Project manager for preparation of a permit application for a new surface mine in Washington County, Pennsylvania. The project included approximately 40 acres of area to be disturbed, three ponds, three spoil disposal areas, access roads, and a reclamation plan. Permit application included H & H and geotechnical analysis and design.

Project Manager; Beth Energy Mine Drainage Permitting; Greene and Washington Counties, PA. Project manager for the preparation of mine drainage permit applications for Beth Energy's No. 51, 58, 60, and No. 91 mines in southwestern Pennsylvania. Mr. Klimek's specific responsibilities included preparing permit narratives and cost estimates, addressing Pennsylvania Department of Environmental Resources

comments, and supervising the preparation of drawings. These permit applications included surface facilities and refuse disposal areas associated with the mines.

Project Engineer; Engineering Feasibility Study of a Refuse Disposal Area; WV. Design engineer for an engineering feasibility study of a refuse disposal area in West Virginia. The project involved preparing conceptual designs and cost estimates for refuse disposal areas to dispose of both coal slurry and coarse coal refuse. Each refuse disposal area design concept included some type of starter dam, which would later be expanded with coarse refuse. Various refuse disposal alternatives included upstream construction, downstream construction, centerline construction, and dike (baffle) construction.

Project Manager; Consolidation Coal Company Final Design and Construction Drawings; Betty, KY. Project manager for the final design and preparation of site work construction drawings for a new coal preparation plant and related facilities in eastern Kentucky. Project was performed in less than 4 months and included more than 2-1/2 miles of roads, a refuse disposal area, two face-up areas, and two major stream relocations and approximately 1,000,000 cubic yards of earthwork. Project included the geotechnical design of cut sludges, embankments, (with associated underdrain and benching requirements), pond embankments, and a rock buttress/soil cure starter dam embankment. Project included preparation of more than 180 drawings.

Project Engineer; Skyline Coal Preparation Plant Design and Construction; Evanston, KY. Project Engineer for the design and construction of the Skyline Coal Preparation plant in Evanston, Kentucky. Provided design and construction inspection services. Responsibilities included design of roads, ponds, site grading, and coal disposal areas. Also prepared both state and Federal permit drawings and documents for this project. During construction, monitored construction for compliance with specifications, revised the design as necessary, monitored progress of construction, and performed field tests.

Project Engineer; Emerald Resources Coal Preparation Plant H&H Analysis; Waynesburg, PA. Project engineer for the H&H analysis of the surface drainage facilities for an existing coal preparation plant in Greene County, Pennsylvania, and the development of a drainage control plan. Project included designing sedimentation pond outlet structures, diversion ditches, site grading, and other drainage improvements including the preparation of a National Pollutant Discharge Elimination System (NPDES) permit application.

Project Engineer; Anaconda Minerals Company Surface Coal Mine Conceptual Design; Las Animas County, CO. Project engineer for the conceptual design of a proposed surface coal mine in Colorado. Project included approximately 50 miles of new haul roads, a preparation plant site, a slurry impoundment, and four alternative rail loadout sites. Mr. Klimek led the design team in the preliminary design phase and later developed quantity takeoffs and cost estimates for the alternatives.

Project Engineer; Coal Preparation Plant Feasibility Study; Greene County, PA. Project engineer for the engineering portion of a feasibility study to evaluate the proposed site of a new coal preparation plant, slope entries, and related facilities in Greene County, Pennsylvania. Project included a conceptual layout of the site, a water availability analysis, floodplain evaluation, and potential access alternatives.

Samuel P. Wilkes, PWS
Project Scientist

EDUCATION: MS, Environmental Science and Policy, Johns Hopkins University, 2003
BS, Earth and Environmental Science, Wilkes University, 1996

CERTIFICATIONS/ REGISTRATIONS: Professional Wetland Scientist, 00001395, 2003
Certified Forest Stand Delineator and Conservation Planner, Maryland, 2003

PRIOR PROJECT EXPERIENCE:

Field Coordination Manager; United States Forest Services Abandoned Mine Land Surveys; Gila and Lincoln National Forests in NM. Mr. Wilkes served as the field coordination manager and assisted with the inventory of over 700 abandoned mine sites throughout the Gila and Lincoln National Forests in New Mexico. He was responsible for the preliminary review of the abandoned mine land database, plotting abandoned mine land sites on topographic maps, and assisting in the three months of site field verification. Once site locations were verified, GPS coordinates; photographs, and an abandoned mine land inventory worksheet (which included information about open audits, shafts, tailings piles, overburden piles, acid mine drainage, subsidence, and any other human or environmental hazards) were completed for each site.

The hard copy data was entered into an electronic database and delivered to the U.S. Forest Service for remediation prioritization and management purposes. Problems such as open adits, shafts and pits; exposed tailings and waste rock piles typically result in acidic runoff; and acid mine drainage directly from flooded adits or shafts typically exist at abandoned mine sites. Elevated heavy metals concentrations found in soils, tailings, waste rock and acidic waters draining from these sites can adversely affect human health or the environment.

Project Scientist; United States Forest Service Abandoned Mine and Mill Sites Removal Preliminary Assessments; AZ and NM. Mr. Wilkes conducted several removal preliminary assessments for the USFS at various abandoned mine and mill sites throughout Arizona and New Mexico. Many of the mines used cyanide leaching techniques to recover gold and silver along with other metals, such as copper, lead, and zinc as by products. Other hard rock mines investigated produced uranium and mercury ores for milling.

Project Scientist; United States Forest Service Promontory Butte Mine Site Research and Removal Preliminary Assessment; Payson, AZ. Mr. Wilkes conducted research for a limited potentially responsible party (PRP) search and a removal preliminary assessment for the Promontory Butte Mine Site near Payson Arizona. The goals of the investigation were to:

- Quantify the contamination at the site (in the pit, piles, and other features) resulting from the mining activities
- Evaluate the potential for offsite impacts to human health and the environment; and
- Collect information necessary to make generalized initial conclusions regarding site reclamation options.

Project Scientist; United States Forest Service Old Payson Landfill Removal Preliminary Assessment, AZ. Mr. Wilkes managed the Removal Preliminary Assessment for the Old Payson Landfill. The lateral and depth of landfill materials was determined by using a backhoe to dig trenches and test pits throughout the landfill. Various samples were collected and analyzed for contaminants such as volatile organic compounds, semi-volatile compounds, pesticides, PCBs and metals.

John Ludwig
Project Scientist

EDUCATION: MS, Environmental Pollution Control, The Pennsylvania State University, 1997
BS, Environmental Science, Widener University, 1995

PRIOR PROJECT EXPERIENCE:

Project Scientist; Mining NPDES Permit Support for WVDEP; WV. Over the past few years, Tetra Tech has supported WVDEP in the development of metals TMDL development for the Coal River watershed. During the course of TMDL development, EPA approved a revision to the West Virginia Water Quality Standards that altered the zone of applicability of the manganese water quality criterion for the public water supply designated use. The criterion is now applicable only in the five-mile zone upstream of known public or private water supply intakes used for human consumption. The revision resulted many request letters from coal companies to "back-slide" their current manganese effluent limits to technology-based limits. At the request of WVDEP, Tetra Tech conducted a comprehensive analysis to determine the cumulative effect of this backsliding at various downstream locations in the Coal River watershed where the revised manganese criterion is applicable. Mr. Ludwig served as the project manager and technical lead for this project that utilized the calibrated watershed model that was constructed for TMDL development (MDAS) to provide solutions and guidance as to which areas of the Coal River watershed could sustain manganese technology-based effluent limits while maintaining compliance with water quality criteria in the effective zones. Results were summarized into graphical displays in an easy to use format so that WVDEP DMR permit writers can address the above mentioned request letters and issue/re-issue permits quickly and efficiently.

Project Manager; West Virginia TMDL Development for Hydrologic Groups A, B, C, and D; WV. Under contract with WV DWWM, currently serving as project manager for more than 950 metals (iron, dissolved aluminum, manganese, and selenium), pH, fecal coliform bacteria, and biological TMDL in the Upper Kanawha River, Upper Ohio North, Lower Kanawha River, North Branch/Potomac River, Coal River, Gauley River, Potomac River Direct Drains, Greenbrier River, New River, Little Kanawha River, and James River watersheds. These impairments were modeled using various EPA approved models and methodologies such as, MDAS and DESC-R for metals and fecal coliform bacteria. A strength-of-evidence stressor identification methodology was used to identify the likely stressors to the biological community and TMDLs were developed for these stressors. To further define biological impairments, macroinvertebrate tolerance values and a new modeling approach ("dirty reference modeling") were developed using observed data collected throughout the state. The "dirty reference modeling" is a new approach that uses a known impaired site as a "reference" for each type of impairment to which all other sites are compared. A similarity matrix is calculated for each impairment and sites that group together may be impaired for that particular parameter.

Project Manager; WV TMDL Development Support for EPA Region 3; WV. For EPA Region 3, served as project manager for the development of over 1,000 pH and metals TMDLs in West Virginia including the Monongahela River, West Fork River, Tug Fork River, and Guyandotte watersheds. Provided lead role both technically and administratively in the evaluation of data and pollutant sources to assess and determine relationships between acid mine drainage and in-stream metals concentrations. Developed various technical approaches related to mining impacts (nonpoint and point sources) on metals loading and applied the Mining Data Analysis System (MDAS), a dynamic watershed modeling tool, to develop TMDLs throughout West Virginia. TMDL development addressed a variety of case-specific requirements related to water quality criteria, water use designations, source pollution conveyance methods, and permitting in large-scale watersheds. Applied the Environmental Fluid Dynamics Code (EFDC), a 3 dimensional hydrodynamic model, to develop TMDLs for the Monongahela River mainstream. Applied DESC-R to dynamically simulate the fate and transport of dissolved aluminum in the Guyandotte watershed. Documented the technical approaches and compiled TMDL results in a final report.

Lawrence A. Drane, III, PG
Project Geologist

EDUCATION: MS, Hydrogeology and Geophysics, University of Toledo, 1993
BS, Geology (Minor in Civil Engineering), Youngstown State University, 1989

CERTIFICATIONS/ REGISTRATIONS: Professional Geologist, Pennsylvania, PG002762G, 1995

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training
OSHA 1910.120 8-Hour Annual Refresher Training

PRIOR PROJECT EXPERIENCE:

Project Manager; Ohio River Clean Fuels Services; Wellsville, OH. Managed portion of proposed $5.5 Billion Coal-to-Liquid Fuel facility. Overall Management of Deep Mine Exploration and Analysis, Environmental, Air Permitting, Water Permitting, Ohio Power Siting Board Application, Geological Exploration, Archeological Studies, Noise Analysis, Geotechnical Studies, Preliminary Site Civil, Wetland and Stream Assessments, Indiana Bat Survey, 401/404 Permitting and Mitigation, Alternative Site Analysis, and several other smaller subtasks.

Assistant Project Manager; Due Diligent Services and Mining Operations Review for a Confidential Client; WV, OH, and PA. Managed the Due Diligent services for a company acquisition of several sand and gravel operations in West Virginia, Ohio, and Pennsylvania. Conducted Phase I Environmental Assessments, Wetland Determinations, and review of mining operations.

Technical Manager; Ohio Sand and Gravel Operations Surface Mining Permitting; OH. Coordinated and conducted field activities for surface mining permits at several sand and gravel operations throughout the state of Ohio. Field activities included mapping and surveying, surface and groundwater sampling, and evaluation of existing conditions. Prepared the mining applications, prepared annual reports, surface water engineering and permits, reclamation plans, and bonding evaluations.

Technical Manager; Zimnox Coal Company Surface Mining Activities; Brilliant, OH. Coordinated and conducted the field activities for a surface mining area in Brilliant, Ohio. Activities included mapping and surveying, surface and groundwater sampling, and evaluation of existing conditions. Prepared the mining application, surface water engineering and permits, and the reclamation plan. The reclamation plan included reclamation of contour mining that was previously conducted in the area.

Project Manager; Buckeye Industrial Mining Permitting; Wellsville, OH. Prepared air and water permits for a coal unloading facility. Also conducted wetland and ecological studies of the property.

Technical Manager; Blume Coal Company Surface Mining Activities; Malvern, OH. Coordinated and conducted the field activities for a surface mining area in Malvern, Ohio. Activities included mapping and surveying, surface and groundwater sampling, and evaluation of existing conditions. Prepared the mining application including the reclamation plan. Worked closely with local residents in application preparation.

Technical Manager; Southwest Portland Cement Company Mining Services; Fairborn, OH. Conducted field mapping and surveying for Annual Reports. Calculated affected area for bonding and prepared addendums and permit applications for mining expansion areas.

Assistant Project Manager; CONSOL Energy Acid Mining Drainage Assessments; Pittsburgh, PA. Conducted acid mining drainage assessments and remedial option analysis for two areas in Pennsylvania.

Project Geologist; Weirton Construction Surface Mining Activities; OH. Conducted field activities for a surface mining area at mining facilities in eastern Ohio. Activities included mapping and surveying, surface and groundwater sampling, and evaluation of existing conditions. Prepared the mining application including the reclamation plan. Worked closely with the local residents in application preparation.

Ben Hoppe
Lead CADD Professional

EDUCATION: AAS, Johnson College, 2004

PRIOR PROJECT EXPERIENCE:

CAD Designer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Fisher Run Portal Closure; Weston WV. Mr. Hoppe's responsibilities included creating existing conditions plans and sections along with mine void information to adequately design structures to seal mine and convey mine water discharge. Also performed design of multiple piping and ditch conveyance systems to allow mine water to discharge to existing streams.

CAD Designer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Tunnelton Mine Portal Closure Design for Acid Mine Drainage; Tunnelton, WV. Mr. Hoppe's responsibilities included creating existing conditions plans and sections along with mine void information to adequately design structures to seal mine and convey mine water discharge. Also performed design of multiple piping and ditch conveyance systems to allow mine water to discharge to existing streams.

CAD Designer; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Paint Branch Mine Project; Kanawha, WV. Mr. Hoppe performed design services on this project, which included the installation splash pads and metal bat gates on three abandoned mine portals and removal approximately 48 abandoned bridge piers in Paint Branch.

CAD Designer; South Fayette Conservation Group Gladden Mine Discharge Passive Treatment System (in association with PADEP); South Fayette Township, PA. Design required creation of existing conditions plans and sections along with design of 2 ½ acre pond separated into 3 chambers using earthen berms. Pond required berm with graded access road into pond area and along perimeter. Sections and profiles were created along pond and access road. Access road required horizontal and vertical geometry to be included on plan and profiles.

CAD Designer; East Monongahela Sportsman's Club, Erosion and Sediment Pollution Control Plan; Elizabeth, PA. Responsibilities included creating existing contours and existing site plan from information provided by surveyor. Design of proposed grading plan including sections, volume calculations and erosion and sediment pollution control measures.

CAD Designer; Big Boulder Subdivisions; PA. Responsibilities included roadway layout and grading including profiles and cross-sections, lot layout adhering to county ordinances for sizing, and layout of pressurized water system for three 50 acre subdivisions. Also involved in storm water design and erosion & sedimentation control measures. Calculated all earthwork and material quantities and was responsible for quality control on Final drawing packages of up to 35 drawings each.

CAD Designer; Mini-Midlake II Condo Design; PA. Architectural design of 3-story, 6-unit condo on a lake in the Poconos. Project encompassed all aspects of architectural design including foundation design and layout of each floors walls, doors and windows and also all utilities for each floor and the building. A second design had to be completed to adhere to ADA requirements and required changes throughout the building. Final renderings were created of the exterior of the building to help client visualize the finished product.

CAD Designer; Scranton Sewer Authority; PA. Created multiple 3D models from as-built drawings and incorporated new 3D piping designs to create contract drawing set. Designed systems ranging from 4"-6" PVC up to 12" – 16" D.I.P. Responsibilities included design piping systems with little input from engineers and ensuring proper clearances and locations of all fittings and valves. Also responsible for QA/QC of final drawing package.

ORGANIZATION CHART

Thomas Gray, PE
Project Manager

Richard Gray, PG
Project Advisor

Dave Hallman, PE, PG
Project Advisor

Design Phase Services

Thomas Gray, PE
Biff Cummings, PE
Anthony Klimek, PE
Allan Berenbrok, PE
Matthew Furniss, EIT
Lawrence Drane, PG
Jon Ludwig
Samuel Wilkes, PWS
Michael Byle, PE

CADD Professionals

Ben Hoppe
Robert Butt
Karen Hartley
Carly Kramer

Surveying and Drilling

Triad Engineering

Construction Monitoring

Allan Berenbrok, PE
Matthew Furniss, EIT

= Tetra Tech

= Subconsultant

Project Descriptions

TETRA TECH

Majorsville Pipeline Alignment Mine Subsidence Study

Majorsville, Pennsylvania

Client Name
MarkWest Energy

Project Highlights
- *Subsidence investigation*
- *Preparation of pipeline alignment profiles*

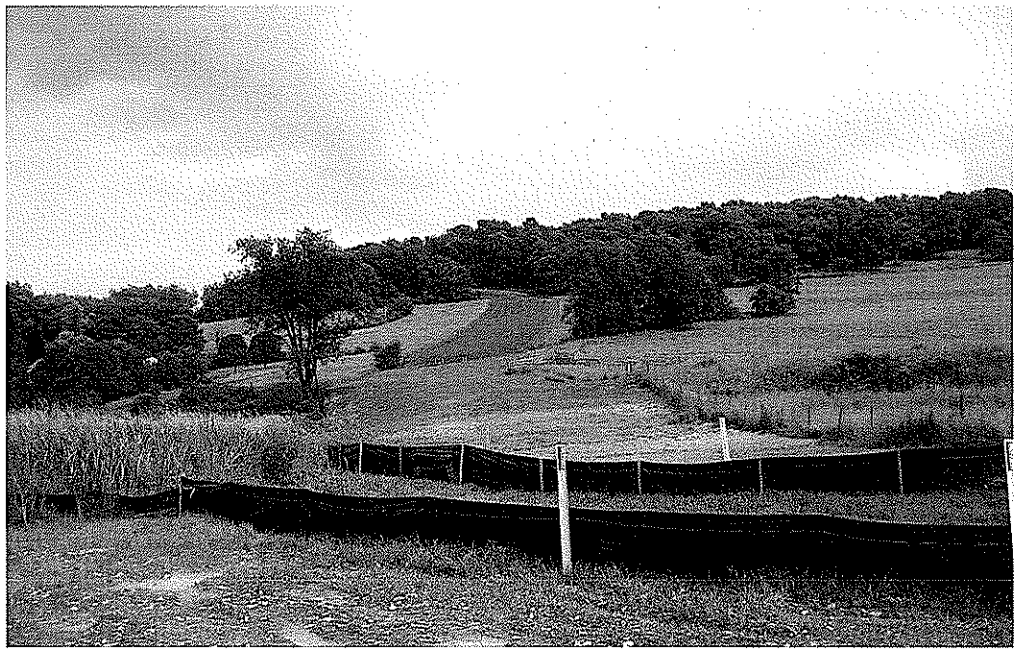
Project Cost
$10,000

Completion Date
Ongoing

Tetra Tech is performing a preliminary subsidence investigation for a natural gas pipeline for MarkWest Energy. Tetra Tech was tasked with evaluating the potential for subsidence along two proposed natural gas pipeline alignments totaling over 28 miles in length in southwestern Pennsylvania.

Relevant mine maps for the area of interest were reviewed. The mine workings which fall under the proposed pipeline alignments include active and abandoned longwall mines as well as a section of abandoned room and pillar mining. Tetra Tech georeferenced the maps and depths of the mine workings and the positions of the proposed pipeline alignments. Profiles of the pipeline alignments were prepared to determine the relative depth from the surface to the mine workings.

Based on the depths, types of mining, and projected future mining Tetra Tech recommended that an engineering subsidence evaluation be completed that would include stress/strain calculations and the identification and sizing of the anticipated subsidence trough. This information would be supplied to the designer of the pipeline for their use.



TETRA TECH

Marjol Battery Plant RFI Oversight and Mine Subsidence Evaluation

Throop, Pennsylvania

Client Name
EPA Region 3

Project Highlights

- *Geomorphic modeling and sediment load analysis*
- *HEC-RAS hydraulic modeling*
- *Passive AMD treatment alternatives evaluated*
- *MCACES cost estimate and preparation of construction documents*
- *Met a three-week deadline to complete this project*

Project Cost
$64,100

Completion Date
Ongoing

Tetra Tech is providing technical assistance to EPA Region 3 to oversee an RFI at the former Marjol Battery Plant in Throop, Pennsylvania. The project includes providing field oversight of rock coring, soil and ground-water sampling, monitoring-well installation, downhole video, and packer testing. The project also involved providing technical support to EPA, including geological and hydrogeological analysis of matters relating to mine subsidence and contaminant fate and transport, supporting EPA at public meetings, split sampling with the owner-operators, and the technical review of work plans and the RFI report submitted by the owner-operators.

This project was politically sensitive, because off-site migration of the contaminants into nearby residential areas resulted in a CERCLA removal action. Political and community awareness of the RFI activities on site was high. This RFI was monitored by members of Pennsylvania's congressional delegation, and at least one prospective presidential candidate was filmed outside the site prior to the Pennsylvania Primary.

This site is underlain by several coal mining voids, providing an unusual geologic and hydrogeologic setting. Tetra Tech provided EPA with expertise in mine subsidence, because that issue will be important to determine the final corrective measure. Tetra Tech also provided EPA with expertise in contaminant fate and transport and engineering controls of contaminant movement associated with the site. In addition to providing extensive field oversight, Tetra Tech has reviewed the RFI work plan and the draft RFI report for compliance with the work plan, a s well as the aspects related to mine subsidence, contaminant fate and transport, and engineering controls of contaminant migration. Tetra Tech met a three-week deadline for this RFI review.

TETRA TECH

Highway 33 Nelsonville Bypass Subsidence Mitigation Value Engineering Services

Nelsonville, Ohio

Client Name
Ohio Department of Transportation

Project Highlights
- *State-of-the-Art Subsidence Mitigation Measures*

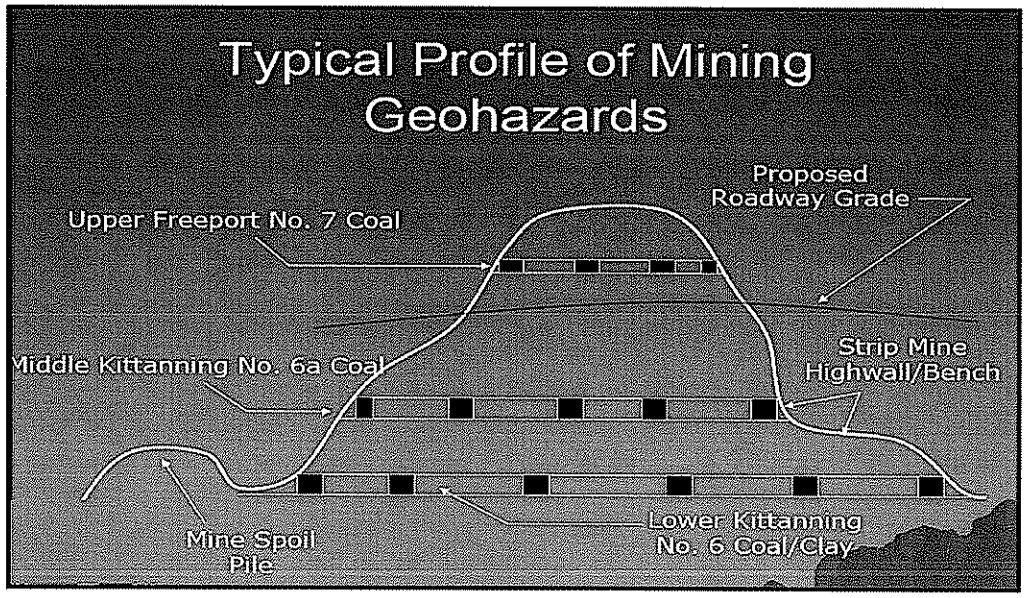
Project Cost
$50,000,000

Completion Date
Ongoing

The Highway 33 Nelsonville Bypass project in southeast Ohio includes 8.5-miles of 4-lane roadway and several interchanges. The estimated $200 million project is being funded in part by the economic stimulus effort and is the largest such project in Ohio. The roadway is underlain by historic room and pillar coal mine workings located on multiple coal seams at shallow depth. Subsidence risks posed by these historic mine workings require mitigation to protect the roadway. Subsidence risk assessments and mitigation design conducted by the geotechnical team in conjunction with the State identified 14 sites along the alignment requiring subsidence mitigation with an estimated cost of approximately $50 million. The mitigation efforts recommended include drilling and backfilling the mine voids using pressure grouting techniques with a sand-cement-fly ash mixture.

Tetra Tech was contracted by the Ohio Department of Transportation (ODOT) to provide value engineering services for alternative means and methods to reduce the cost of the subsidence mitigation effort. Several viable alternatives were identified and recommended with potential to realize significant cost savings, including:

- The use of a sand flushing technique incorporating an innovative state-of-the-art geofoam® product to mobilize and transport the sand backfill in lieu of a water-based sand slurry or cement based grouts
- Column-building local roof support grouting techniques
- Real-time subsidence risk assessments to implement specific mitigation measures on a localized basis during the course of construction rather than uniform global treatment methods.



TETRA TECH

Colorado Springs Subsidence Abatement

Colorado Springs, Colorado

Client Name
Colorado Department of Natural Resources, Division of Reclamation, Mining & Safety

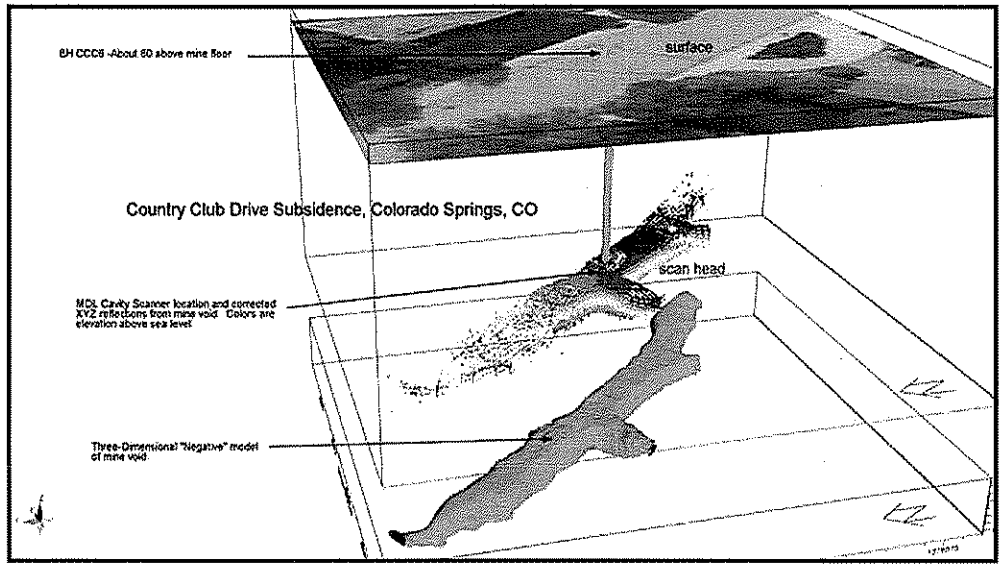
Project Highlights
- *Subsidence Hazards Assessment*
- *State-of-the-Art Geophysical Imaging*
- *Subsurface Investigations*

Project Cost
$210,000

Completion Date
2009

Approximately 16 million tons of coal was mined underground in an area that now underlies parts of Colorado Springs. Coal mining occurred from the late 1800's to the 1950's to use in fuel transportation, gold mining and home heating applications. After the mines closed, many previously rural areas in the coal field were subsequently developed as residential subdivisions and suburbs of Colorado Springs. The shallow underground coal mines typical of this coal field have continued to subside and cause damage, posing serious hazards to the public and homeowners. Thick deposits of unconsolidated sand over thin claystone and sandstone roof strata have caused sudden and spectacular surface subsidence events ranging from settlement of a few inches to sink holes up to 12 feet in diameter and 12 feet in depth.

Tetra Tech was selected as part of a project team on the basis of the team's unparalleled qualifications in geological engineering, geophysical investigations, underground mine design, and grouting. Detailed geomechanical characterization of the subsurface conditions provided by Tetra Tech was coupled with highly advanced state-of-the-art geophysical imaging and processing techniques to delineate mine voids. Subsurface investigations included the use of laser cavity scanning surveys, down hole cameras, and 3D imaging to characterize the mine voids which were subsequently backfilled using an innovated foam-based sand slurry.



TETRA TECH

Colorado School of Mines Subsidence Abatement

Golden, Colorado

Client Name
Colorado Department of Natural Resources, Division of Reclamation, Mining & Safety

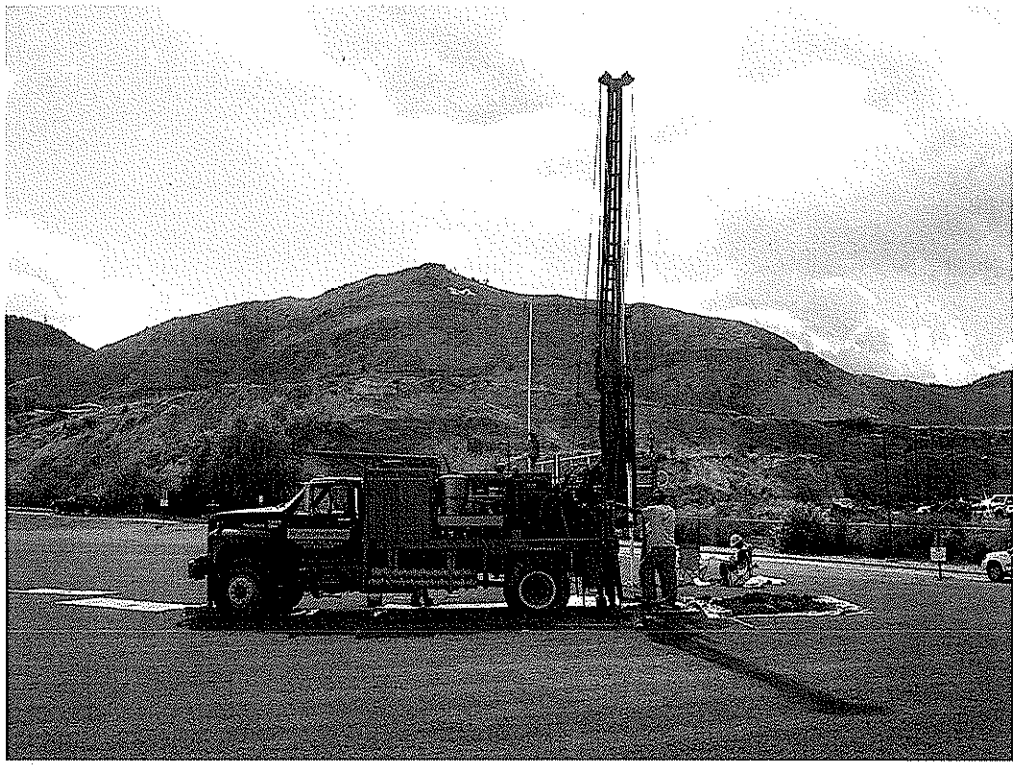
Project Highlights
- *Subsidence Hazards Assessment*
- *State-of-the-Art Geophysical Imaging*
- *Subsurface Investigations*
- *Public Meeting Participation*

Project Cost
$200,000

Completion Date
2008

The western portion of the Colorado School of Mines campus was the location of historic coal mining and clay mining. In this area the sedimentary strata are tilted up vertically by structural deformation related to the Front Range uplift and movement on the Golden Fault. This structural orientation of the seams made extraction of coal and clay relatively easy to mine, beginning in about 1877. As a result of underground mining, subsidence, the poorly-backfilled and un-backfilled sections of coal and clay mines has caused chronic subsidence damage at the surface for the past 40 years. These events have ranged from damage and condemnation of married student housing units, gaping subsidence holes in the athletic field, damage and destruction of street improvements, and a 15 feet deep sinkhole that appeared suddenly in West Campus Drive.

Tetra Tech was selected as part of a project team on the basis of the team's unparalleled qualifications in geological engineering, geophysical investigations, underground mine design and grouting. Detailed geomechanical characterization of the subsurface conditions provided by Tetra Tech was coupled with highly advanced state-of-the-art geophysical imaging and processing techniques to delineate mine voids and allow subsidence risks to be better quantified.



TETRA TECH

Sunrise Mine AML / Subsidence Monitoring

Guernsey, Wyoming

Client Name
Wyoming Department of Environmental Quality, Abandoned Mine Land Division

Project Highlights

- *Evaluated stability of existing subsidence features*
- *Assessed the potential for landslide induced wave action to overtop pit containment*

Project Cost
$200,000

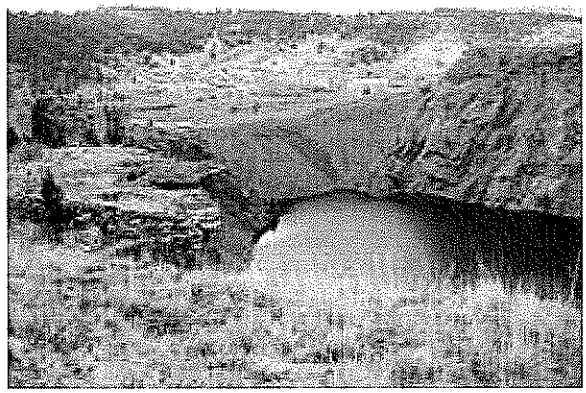
Completion Date
2006

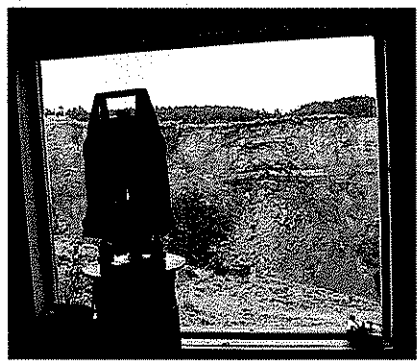
The Sunrise Iron Mine was owned and operated by Colorado Fuel & Iron from the late 1800's until production ceased in 1980. Open pit and underground block caving methods were employed to extract ore from three principal ore bodies; Sunrise Pit, Columbia Gulch and Central Ore Body.

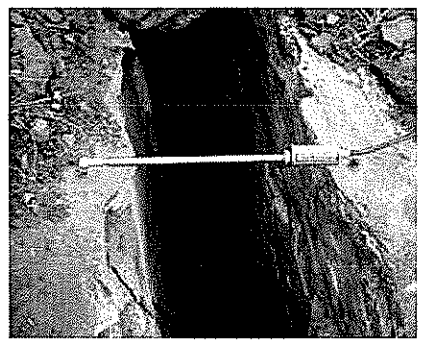
Caving into the large cavities that remained daylighted the underground workings and resulted in vertical and in some cases overhanging subsidence features. This subsidence and continued spalling and failure of the rims created extreme hazards.

The potential for mass failure of an entire wall of the Sunrise Pit created concerns for displacement of a large volume of water from the now flooded pit. The potential flood wave poses a low-probability but high consequence risk to residents a short distance downstream.

Tetra Tech personnel installed a real-time remote monitoring instrumentation system to monitor stability of the pit highwall. This system consisted of a network of crack gauges powered by a solar-battery configuration and a computer controlled robotic total station which automatically surveyed prisms located on the opposite pit wall. Data from both types of instruments were then sent by wireless telemetry and the internet to the engineering personnel who were able to monitor for slope movements from the office.







TETRA TECH

IHI Mine Fire and Subsidence Evaluation

Rifle, Colorado

Client Name
Indiana County Conservation District

Project Highlights
- *Will reclaim 20 acres of abandoned mining*
- *Will passively treat AMD*
- *Will restore 1,000 feet of stream*

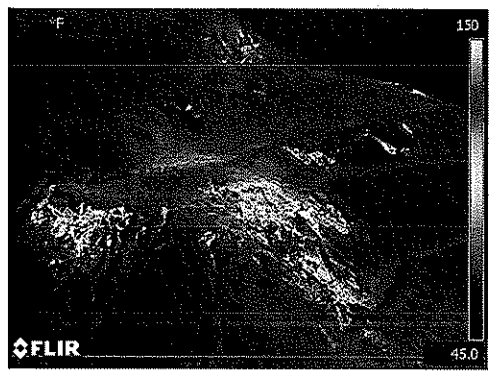
Project Cost
$250,000 (est.)

Completion Date
Ongoing

The historic IHI coal mine is located in Haas Canyon in the Grand Hogback approximately 8 miles north of Rifle, CO. The mine was developed in the steeply dipping, 11-foot thick Wheeler coal seam. Coal was mined in Haas Canyon from 1898 to around 1945 in a number of mines. The IHI No. 3 coal mine, part of which is presently burning beneath the surface, operated from 1940 to 1945. Beginning in 1948, a series of investigations and fire control projects were implemented to prevent the original mine fire from spreading into the active and abandoned mines in Haas Canyon, and the adjacent coal reserves. The previous projects temporarily reduced the fire activity; however, the fire has become increasingly active over the past few years and presents a hazard to public health and safety as well as a wildfire hazard. The surface expression of the fire includes several hot exhaust cracks and vents, some venting to 800 degrees Fahrenheit. The combination of the steep terrain and the large, underground mine voids provides the potential for future surface subsidence, particularly over the active mine fire or previous burnt areas. Ongoing subsidence allows oxygen intake which further fuels the active fire.

Tetra Tech was selected as part of a project team to characterize the coal mine workings and determine the relationships that exist between the areas of subsidence, the burning coal seam, and the previously placed grout. The program includes utilizing non-invasive geophysical methods, thermal imagery, ventilation mapping, and 3D animation to accomplish the mine characterization. The results of the investigation will be utilized to develop a future mine fire abatement program at the IHI site. Tetra Tech's role includes providing:

- Health and Safety protocols,
- Thermal Imagery
- Smoke/Inert Gas Tracer Study
- Surveying
- GIS Implementation to Evaluate 3-D Geometrical Relationships
- Coal Mine Fire Expertise



TETRA TECH

Wyoming Abandoned Mine Lands Subsidence Hazards Mitigation Project

Rock Springs, Wyoming

Client Name
Wyoming Department of Environmental Quality Abandoned Mine Lands Division

Project Highlights

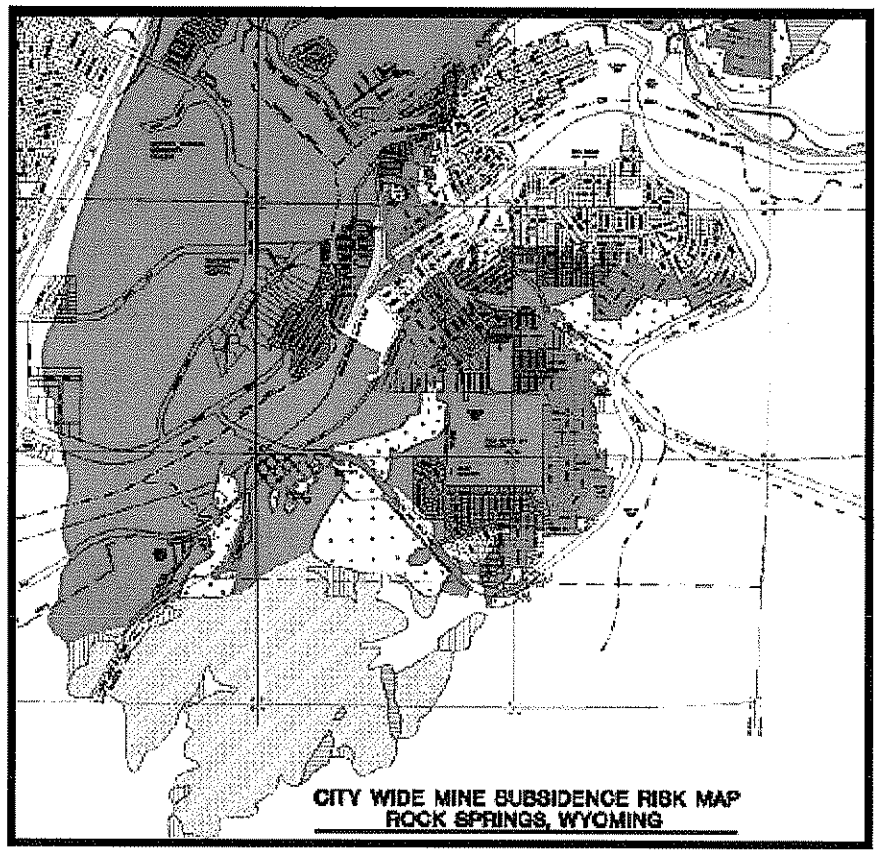
- *Extensive use of GIS to assimilate data from thousands of existing borings*
- *State-of-the-art geophysical imaging*
- *Subsurface Investigations*
- *Air quality monitoring for mine gases*
- *Structural distress surveys and structural monitoring*
- *Subsidence hazards assessment*
- *Public meeting participation*

Project Cost
$2,100,000

Completion Date
Ongoing

The Wyoming Abandoned Mine Lands (AML) Project 17.6A is a State-Wide ID/IQ contract for mitigating coal mine subsidence hazards awarded to Tetra Tech by the Wyoming Department of Environmental Quality Abandoned Mine Lands Division. Initial work under this contract includes assessment of subsidence hazards within the City of Rock Springs where historic underground coal mining from the 1860s to 1950s resulted in approximately 900 acres of the city being undermined and a history of moderate to severe subsidence as a result.

Although subsidence mitigation efforts have been implemented through a number of previous projects for AML and the Bureau of Mines by others, Tetra Tech was selected for the current work on the basis of the unparalleled qualifications of its multi-disciplinary project team including specialists in geological engineering, forensic geotechnics, geophysical investigations, underground mine design and grouting. Detailed geomechanical characterization of the subsurface conditions coupled with highly advanced state-of-the-art geophysical imaging and processing techniques to delineate mine voids are being used to allow subsidence risks to be accurately quantified and focused and cost-effective mitigation solutions to be developed.



TETRA TECH

West Elk Mine and Dry Fork Mining Areas Subsidence Evaluation

Gunnison County, Colorado

Client Name
Mountain Coal Company, LLC

Project Highlights
- *Subsidence evaluation*
- *Computer modeling*
- *Evaluation of potential impacts*

Project Cost
$4,100,000

Completion Date
2007

Mountain Coal retained Tetra Tech's Pittsburgh office to prepare a report to describe the extent to which projected subsidence would impact the surface area, including stream channel stability and sediment transport, at their West Elk Mine located in the Dry Fork mining area of Colorado. The new mining area extended their longwall mining under the upper areas of Dry Fork, a tributary to Minnesota Creek, and the upper areas of Deep Creek. A detailed discussion of the mine plan and projected subsidence for these areas was provided. A hydraulic and hydrologic evaluation was done to establish pre-mining, or baseline, conditions. The second portion of this evaluation described the potential and likely impacts of mining operations on the surface drainage system and channel characteristics.

Subsidence information obtained from the current West Elk Mine area was used to project subsidence processes, amounts, and the effects on the Dry Fork mining areas. The application document was prepared to comply with the Colorado Division of Minerals and Geology (CDMG) Regulations for Coal Mining, revised June 26, 2002, under Section 2.05.6, Mitigation of the Impacts of Mining Operations. Reconnaissance of the area was conducted in 2007.

Tetra Tech used the predicted subsidence information and the areas angle of draw to evaluate the potential impacts to: landslide and rockfall prone areas, a manmade reservoir, stock watering ponds, streams and ditches, prings, water-bearing zones, groundwater wells, roads, and buildings.

A detailed subsidence control plan was prepared and approved with only minor comments from the Colorado Division of Minerals and Geology.

TETRA TECH

West Virginia Department of Environmental Protection Water Quality and Modeling Support

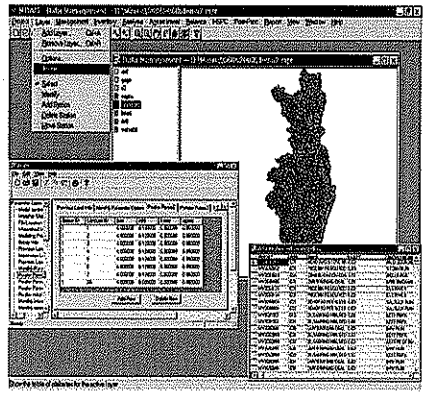
West Virginia

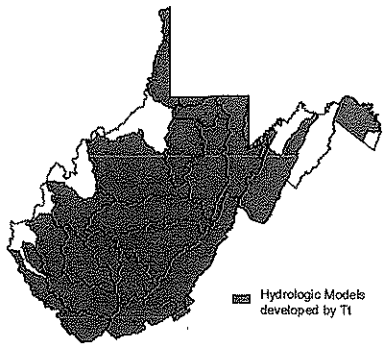
Client Name
West Virginia Department of Environmental Protection (WVDEP)

Project Highlights
- *Hydrologic Modeling*
- *AML Source Tracking & Assessment*
- *AMD Water Quality Modeling*

Project Cost
$4,100,000

Completion Date
Ongoing





Tetra Tech is a nationwide leader in hydraulic and hydrological analyses for hydraulic features and other infrastructure planning, design, and construction. Tetra Tech offers specialized experience and technical competence in hydraulic, hydrodynamic, watershed, storm water, groundwater, and water quality modeling; data collection and analysis; environmental analysis and compliance; and stream and lake restoration. This expertise coupled with extensive experience gained through conducting the many TMDL studies provides Tetra Tech with a thorough understanding of the dynamic hydrologic, hydraulic, and water quality processes associated with AMD throughout West Virginia.

Over the past 8 years, Tetra Tech has supported the WVDEP and EPA Region 3 to develop and fine-tune a Total Maximum Daily Load (TMDL) methodology to address various water quality impairments due to acid mine drainage in West Virginia. Tetra Tech developed this innovative modeling approach, the Mining Data Analysis System (MDAS), to simulate hydrologic and water quality conditions throughout large watersheds. MDAS is a comprehensive GIS, dynamic modeling, and analysis package that provides the ability to overcome the difficult simulation of a large-scale watershed while maintaining a great level of detail. The watershed modeling process involved the compilation of meteorological, land use, stream and land use-specific hydrology and pollutant data; hydrologic calibration and water quality calibration; and generation of nonpoint source and in-stream flows and pollutant loadings. In order to account for the multiple mining related sources, additional land use categories that are specific to AMD were represented as nonpoint sources (e.g. high walls, portals, and disturbed land from abandoned mines).

Since 2003, Tetra Tech has been the exclusive TMDL contractor for WVDEP and Tetra Tech staff routinely work with WVDEP staff to identify hydrologic and water quality characteristics of abandoned mines throughout West Virginia. Furthermore, Tetra Tech has a great deal of experience querying WVDEP's AML databases, which we have access to through a virtual private network connection from our Charleston, WV, office. To date, Tetra Tech has constructed and calibrated hydrologic models that cover more than 82% of West Virginia. WVDEP and Tetra Tech have worked together to characterize the hydrologic and water quality impacts from mining sources. Sources such as acid mine drainage not only pose human health risks but environmental risk and violations to the water quality standards.