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Header @ 1

List View

- General Information**
- Contact
- Default Values
- Discount
- Document Information
- Clarification Request

Procurement Folder: 1257505  
 Procurement Type: Central Purchase Order  
 Vendor ID: 000000232671   
 Legal Name: TETRA TECH INC  
 Alias/DBA:  
 Total Bid: \$0.00  
 Response Date: 08/31/2023   
 Response Time: 9:30  
 Responded By User ID: katie.pugh   
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 Last Name: Pugh  
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 Phone: 740-298-9062

SO Doc Code: CEOI  
 SO Dept: 0313  
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 Solicitation Description: EOI - 2023 AML Contract N4  
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Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

**State of West Virginia  
 Solicitation Response**

**Proc Folder:** 1257505  
**Solicitation Description:** EOI - 2023 AML Contract N4  
**Proc Type:** Central Purchase Order

Solicitation Closes	Solicitation Response	Version
2023-08-31 13:30	SR 0313 ESR08312300000001124	1

**VENDOR**  
 000000232671  
 TETRA TECH INC

**Solicitation Number:** CEOI 0313 DEP2400000008  
**Total Bid:** 0  
**Response Date:** 2023-08-31  
**Response Time:** 09:30:32  
**Comments:**

**FOR INFORMATION CONTACT THE BUYER**

Joseph E Hager III  
 (304) 558-2306  
 joseph.e.hageriii@wv.gov

**Vendor Signature X** **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Beech Bottom Highwall				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

**Commodity Line Comments:**

**Extended Description:**

Beech Bottom Highwall

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	Bethany (Haizlett) DS, Highwall and AMD				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

**Commodity Line Comments:**

**Extended Description:**

Bethany (Haizlett) DS, Highwall and AMD

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	Buffalo Creek Highwall				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

**Commodity Line Comments:**

**Extended Description:**

Buffalo Creek Highwall

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
4	Crafts Run Maintenance				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

**Commodity Line Comments:**

**Extended Description:**

Crafts Run Maintenance

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
5	Logan Run Highwall				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

**Commodity Line Comments:**

**Extended Description:**

Logan Run Highwall

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
6	Richard Mine Drainage Facility Upgrades				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

**Commodity Line Comments:**

**Extended Description:**

Richard Mine Drainage Facility Upgrades

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
7	Wades Run Dangerous Embankment				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

**Commodity Line Comments:**

**Extended Description:**

Wades Run Dangerous Embankment



## WVDEP-AMLR

### EOI – N4

#### 1.0 BACKGROUND

Tetra Tech has extensive experience in the remediation of both active and abandoned mine sites and in the completion of all types of Civil/Mining Engineering projects. Tetra Tech has a mining group headquartered in Pittsburgh, Pennsylvania with satellite offices in West Virginia and Ohio with staff committed to developing, designing, overseeing, and completing mine reclamation projects in the Appalachian region. This group has twenty-one experienced staff including eight engineers and technical staff who formerly worked for state AML programs or OSM and numerous other staff who have completed abandoned mine reclamation projects similar to those that West Virginia is proposing to undertake. This group is headed by Eric Cavazza who worked for Pennsylvania's AML Program for 36+ years and who served as the program director from the beginning of 2012 until the end of 2020. Staff in the group have completed numerous reclamation designs in Pennsylvania, Maryland, Ohio, West Virginia, and Kentucky. Tetra Tech has experts in all phases of AML work from initial site investigations through design and permitting and construction management. Tetra Tech has a similar mining group in the west based primarily out of the Denver, Colorado area with many very experienced staff who have worked and designed numerous AML projects. If needed, those staff can be consulted or brought in to assist with any unique or difficult AML project sites.

Based on the anticipated workload associated with this expression of interest, the mining group staff will lead the projects and also utilize local Tetra Tech staff from our West Virginia office locations. This group is very experienced and should be sufficient to undertake and complete the projects. However, if Tetra Tech's workload changes or the WV DEP's support need increases, we can recruit staff from other groups in Pittsburgh or other Tetra Tech offices and locations to support these projects as needed. Tetra Tech has over 27,000 employees corporate-wide, and many with mining and abandoned mine experience that we have access to. We will also add staff, especially locally in West Virginia, to support these projects if necessary. West Virginia will have the advantage of working with a small group of highly experienced AML staff for projects while knowing that for any unique, difficult, or challenging projects that come up, we have access to a wide variety of experts which can be consulted as needed to deliver the project results WV DEP is seeking. These resources will enable Tetra Tech to complete assigned work in the time required. With our highly experienced staff, many with state AML program experience, we believe we can serve as an extension of your staff – able to hit the ground running to get these important projects completed for West Virginia.

Upon receipt of the formal notice to proceed, Tetra Tech would attend an on-site project kick-off meeting at the site with WVDEP personnel to discuss the project issues and work plan to reach a consensus on the technical approach for the site. The kick-off meeting would also provide the opportunity for WVDEP personnel to express to Tetra Tech their concerns, objectives, and initial thoughts on the project. Upon completion of the on-site project kick-off

meeting a *Document of Understanding* will be prepared by Tetra Tech for the Project Area for review and input by WVDEP to create a work plan and goal-oriented document for the project.

Base mapping will be required for the project. It is Tetra Tech's assumption the mapping will be provided for the project, in which case, some additional checks, spot locations, and potential additional feature items may be required to be located for design purposes. If the base mapping is to be developed by Tetra Tech, a sub-contract surveying company will be utilized for these services.

Based on the initial and available information, a preliminary conceptual plan will be prepared for review by WVDEP personnel. The preliminary conceptual plan will identify the general layout of the site, specific issues identified, proposed water routing, areas of additional concern and in the case of land stability issues, soil borehole locations associated with the proposed geotechnical investigation. A geotechnical sampling plan will be developed for the site in order to address issues identified by the WVDEP/Tetra Tech team members. The soil sampling will be conducted, and appropriate testing will be performed by Tetra Tech's in-house soils laboratory. For open portals, sites will be evaluated for potential bat habitat and, if warranted, bat surveys will be subcontracted. For management and control of underground mine pools, monitoring wells may be necessary. Once detailed information on the nature and extent of the mine pool is determined, the pool may be managed and controlled via pumping, gravity drains, wet seals, horizontal and directional bores, or other means.

All aspects of the project will comply with Infrastructure Investment Jobs Act (IIJA) including compliance with Davis-Bacon and Build America, Buy America (BABA), as applicable and all federal, State and Local Laws.

## **2.0 CONTRACT WIDE TASKS**

Within this contract there are several tasks which will need to be addressed for all of the projects. Those tasks are outlined below.

### **2.1 PLANNING TASK**

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Tetra Tech will use OSMRE REG-1, Handbook on Procedures for Implementing the National Environmental Policy Act (NEPA Handbook) (Revised 2019). Depending on the significance of the actual and potential impacts of the proposed project, one of three potential analytical approaches under NEPA may apply: 1) Categorical Exclusion (CE); 2) Environmental Assessment (EA), which may result in a Finding of No Significant Impact (FONSI) or a Notice

of Intent (NOI) to prepare an Environmental Impact Statement (EIS); 3) Environmental Impact Statement (EIS) and Record of Decision (ROD).

Tetra Tech will also coordinate the project with various different agencies to ensure that no adverse effect is seen. This includes consultations with West Virginia Division of Natural Resources (WVDNR), West Virginia Historic Preservation Office (SHPO), WV Regional Planning, US Forest Service, and US Fish and Wildlife Services (USFWS). Based on the results of these consultations additional studies may be needed, this may include but is not limited to bat studies, threatened and endangered species investigation, historic or cultural resource evaluations, water quality sampling, and data collection/analysis.

## **2.2 REALTY TASK**

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Tetra Tech will research legal ownership of properties by conducting a thorough search of deed records at the county courthouse and provide legal documentation to substantiate legal ownership findings (if required). Tetra Tech will obtain all required exploratory rights of entry (EROE) and construction rights of entry (CROE) for each project as required.

## **2.3 PERMITTING TASK**

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Tetra Tech will prepare and submit to obtain the required permits as determined at the Pre-Design Meeting. Required permit applications will be prepared for submittal for the project. All required plans, specifications and required additional data will be included within the application. Required permits may include the following:

- 401/404 Stream and Wetland Permits
- Construction Stormwater General Permit
- WVDOH Occupancy Permit (Driveway Permit)
- NPDES Modification
- Any other local, state, or federal permit identified as being required for the project.

## **2.4 CONSTRUCTION OVERSITE TASK**

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Tetra Tech will provide a qualified resident project representative, QA/QC certification, and prepare daily field activity logs summarizing construction activities.



## 3.0 PROJECT SPECIFIC APPROACHES

Each project is unique and has its own challenges. Outlined below is Tetra Tech's general approach for each project and AML problem type.

### 3.1 BEECH BOTTOM HIGHWALL

This project is located northeast of the town of Beech Bottom, in Brooke County, WV. The goal of this project is the remediation of a multiple highwalls/highwall benches, multiple portals, installation of a new treatment system, drainage design, hazardous waterbodies, mine spoil and water impoundments.

#### 3.1.1 Remediation of Highwall

Unless otherwise indicated, highwalls from former surface mining cuts or deep mine face up areas will be backfilled to approximate original contour using available onsite spoil materials. If inadequate spoil material remains or is available on the site, and alternate final grade may be proposed, or another source of material will be identified. Specifications will be developed indicating compaction requirements such as degree of compaction, lift thickness and other quality control parameters for compaction during highwall reclamation. If any highwalls have significant loose rock or other signs of instability, additional special requirements may be specified to provide for the safety of the contractor's employees and equipment during construction.

#### 3.1.2 Remediation of Mine Portal

Tetra Tech has extensive experience in the development and design of mine portal seals. Designs have included drilling from a location above and at an angle from the proposed seal and injecting designed grout to form the seal blockage and have also utilized polyurethane foam as a portal seal. This technique of designing and developing the portal seal has proven to be more effective and safer than excavating at the portal entry location and then constructing the concrete or concrete block portal seal. Each mine portal, whether open or collapsed, will be evaluated to determine the best method for reclamation. All However, mine portals will be sealed in accordance with WVDEP approved methods. If endangered species are present, such as various bat species, appropriate bat gates or other structures will be incorporated into the project design. Although it is Tetra Tech's understanding, based on information provided by Mike Sheehan, former WVDEP AML&R Program Administrator and current Tetra Tech employee, that the WVDEP's practice for mine openings is to presume presence of endangered bat species. Therefore, appropriate bat gates or other structures will be incorporated into the project design unless instructed otherwise by the WVDEP.

### **3.1.3 Installation of a New Treatment System**

Tetra Tech would request and review all water sample and flow measurement information for the discharge being treated and for the effluent from the current treatment system. If necessary, additional sampling and monitoring may be rerecommended to develop the design flow and discharge water quality chemistry. Based on the design parameters, a new treatment system would be designed using AMDtreat coupled with other design guidelines and Tetra Tech's past experience for similar sites. The treatment system will be evaluated for constructability on the site. If the available land areas or topography is inadequate for the proposed system other options may be proposed for review and approval by WV DEP.

### **3.1.4 Drainage Design**

Drainage areas within the project area will be determined. If possible, diversion ditches will be located in the upstream area in order to control and divert the drainage around the project area. All drainage ditches, swales, underdrains and culverts will be sized and designed in accordance with standard engineering practices. Size, slope, and lining of the proposed ditches and culverts will be specified on the plans and be based on required storm events. Design of drainage conveyances, including drainage channels, underdrains and /or other controls to safely convey water (including mine water) off-site will be designed in accordance with standard engineering practices and will fully consider the safety of the existing public dwellings and structures near the project areas. For mine water conveyance pipelines, adequate cleanouts will be incorporated to allow for future maintenance of the mine drainage control system. Hydrologic and hydraulic (H&H) analyses will be performed for the site and existing structures. The HydroCAD Stormwater Modeling program will be utilized in analyzing and sizing drainage structures for the project.

### **3.1.5 Hazardous Waterbody**

All hazards will be identified and neutralized. These hazards may be in the form of waterbodies beneath hazardous highwalls or a collapsed portal. These hazards will be addressed according to the specific hazard. All impoundments will be dewatered in a controlled manner while also considering the safety of any existing public dwellings and structures downstream of the project areas and impacts to the receiving stream. Based upon the quality of the impounded water, some form of treatment may be necessary or required prior to discharge. Settling ponds, sumps and rock check dams will be positioned between the impoundment and the receiving stream as necessary. Following dewatering activities, the outside berms will be pushed and compacted in specified lifts to final grade. All impacted areas will be revegetated according to the proposed seeding and revegetation plan.

### **3.1.6 Remediation of Spoil/Refuse Piles**

Reclamation of spoil and/or coal refuse piles will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Spoil and refuse

material shall be regraded and capped with suitable soil found on-site. In the event a suitable soil cannot be found, a borrow area would need to be identified. This may be discussed during the pre-design meeting. Soil testing would be completed by Tetra Tech's in-house soil laboratory located in Morgantown, West Virginia. Alkaline addition may also be considered if desired by WV DEP to prevent or ameliorate AMD seeping or discharging from the refuse material. Necessary liming, soil supplements, and mulching requirements would be specified in the design to ensure adequate growth of vegetation following grading and seeding of the site.

### **3.1.7 Remediation of spoil/pond**

Impoundments will be dewatered in a controlled manner while also considering the safety of any existing public dwellings and structures downstream of the project areas and impacts to the receiving stream. Based upon the quality of the impounded water, some form of treatment may be necessary or required prior to discharge. Settling ponds, sumps and rock check dams will be positioned between the impoundment and the receiving stream as necessary. Following dewatering activities, the outside berms will be pushed and compacted in specified lifts to final grade. All impacted areas will be revegetated according to the proposed seeding and revegetation plan.

## **3.2 BETHANY (HAIZLETT) DS, HIGHWALL AND AMD**

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This project is located west of the town of Bethany in Monongalia County, WV. The goal of this project is remediation of a dangerous highwall, multiple portals, multiple dangerous slides, installation of a new treatment system, drainage design, hazardous waterbodies, clogged stream, mine spoil, and water impoundments.

### **3.2.1 Remediation of Highwall**

Unless otherwise indicated, highwalls from former surface mining cuts or deep mine face up areas will be backfilled to approximate original contour using available onsite spoil materials. If inadequate spoil material remains or is available on the site, and alternate final grade may be proposed, or another source of material will be identified. Specifications will be developed indicating compaction requirements such as degree of compaction, lift thickness and other quality control parameters for compaction during highwall reclamation. If any highwalls have significant loose rock or other signs of instability, additional special requirements may be specified to provide for the safety of the contractor's employees and equipment during construction.

### **3.2.2 Remediation of Mine Portal**

Tetra Tech has extensive experience in the development and design of mine portal seals. Designs have included drilling from a location above and at an angle from the proposed seal

and injecting designed grout to form the seal blockage and have also utilized polyurethane foam as a portal seal. This technique of designing and developing the portal seal has proven to be more effective and safer than excavating at the portal entry location and then constructing the concrete or concrete block portal seal. Each mine portal, whether open or collapsed, will be evaluated to determine the best method for reclamation. All However, mine portals will be sealed in accordance with WVDEP approved methods. If endangered species are present, such as various bat species, appropriate bat gates or other structures will be incorporated into the project design. Although it is Tetra Tech's understanding, based on information provided by Mike Sheehan, former WVDEP AML&R Program Administrator and current Tetra Tech employee, that the WVDEP's practice for mine openings is to presume presence of endangered bat species. Therefore, appropriate bat gates or other structures will be incorporated into the project design unless instructed otherwise by the WVDEP.

### **3.2.3 Slide Remediation**

In order to develop the construction plans and technical specifications for slope stabilization, the development of a geotechnical investigation plan will be completed. The geotechnical investigation plan would consist of the drilling and sampling of soils in the vicinity of the landslide. Tetra Tech will provide a geotechnical engineer on site during the drilling operations. The number, locations, and depths of borings would be dependent on the extent and size of the landslide. In addition to the sampling of soils, the geotechnical boring plan would attempt to identify existing slip planes, the extent and locations of any perched aquifers as well as the elevation of phreatic surfaces at the completion of the drilling and 24 hours thereafter. Soil testing would be completed by Tetra Tech's in-house soil laboratory located in Morgantown, West Virginia. Potential soil tests and number of tests to be conducted would be determined following the geotechnical drilling and sampling operations but typically would include the following tests:

#### **Potential Soil Tests**

- Visual Description
- Grain Size Analyses
- Hydrometer Test
- Moisture Content
- Direct Shear
- Standard Proctor
- Atterberg Limits

Plan and cross section views will be developed for the design of the stabilization and remediation of the landslide area. Plan and cross section views will provide the location and design parameters of the final slope configuration and will show the location and details of proposed subsurface drainage underdrains, final slopes, proposed keyways, and typical detail slope saw-cut excavation as part of the reconstructed/stabilized slope. Stability analyses will be completed

utilizing the Slide 2 program to assist in determining the stable configuration of the final slope configuration with a minimum standard safety margin of 1.5. Specifications will be developed indicating compaction requirements such as degree of compaction, optimum moisture, plus or minus variance on moisture, lift thickness and other quality control parameters for compaction during construction.

### **3.2.4 Installation of a New Treatment System**

Tetra Tech would request and review all water sample and flow measurement information for the discharge being treated and for the effluent from the current treatment system. If necessary, additional sampling and monitoring may be rerecommended to develop the design flow and discharge water quality chemistry. Based on the design parameters, a new treatment system would be designed using AMDtreat coupled with other design guidelines and Tetra Tech's past experience for similar sites. The treatment system will be evaluated for constructability on the site. If the available land areas or topography is inadequate for the proposed system other options may be proposed for review and approval by WV DEP.

### **3.2.5 Drainage Design**

Drainage areas within the project area will be determined. If possible, diversion ditches will be located in the upstream area in order to control and divert the drainage around the project area. All drainage ditches, swales, underdrains and culverts will be sized and designed in accordance with standard engineering practices. Size, slope, and lining of the proposed ditches and culverts will be specified on the plans and be based on required storm events. Design of drainage conveyances, including drainage channels, underdrains and /or other controls to safely convey water (including mine water) off-site will be designed in accordance with standard engineering practices and will fully consider the safety of the existing public dwellings and structures near the project areas. For mine water conveyance pipelines, adequate cleanouts will be incorporated to allow for future maintenance of the mine drainage control system. Hydrologic and hydraulic (H&H) analyses will be performed for the site and existing structures. The HydroCAD Stormwater Modeling program will be utilized in analyzing and sizing drainage structures for the project.

### **3.2.6 Hazardous Waterbody**

All hazards will be identified and neutralized. These hazards may be in the form of waterbodies beneath hazardous highwalls or a collapsed portal. These hazards will be addressed according to the specific hazard. All impoundments will be dewatered in a controlled manner while also considering the safety of any existing public dwellings and structures downstream of the project areas and impacts to the receiving stream. Based upon the quality of the impounded water, some form of treatment may be necessary or required prior to discharge. Settling ponds, sumps and rock check dams will be positioned between the impoundment and the receiving stream as necessary. Following dewatering activities, the outside berms will be

pushed and compacted in specified lifts to final grade. All impacted areas will be revegetated according to the proposed seeding and revegetation plan.

### **3.2.7 Clogged Stream**

An investigation of the length, volume and cause of the clogged stream will be conducted. Based on the results of this investigation a plan will be developed on the best method for removal of the material and subsequent disposal. Work in and around streams will be completed in accordance with all federal and state laws and regulations. Necessary permits would be applied for, and all permit requirements would be incorporated into the design drawings and specifications. The goal of the remediation would be to restore stream channels to their pre-mining condition for both flow and function.

### **3.2.8 Remediation of Spoil/Refuse**

Reclamation of spoil and/or coal refuse piles will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Spoil and refuse material shall be regraded and capped with suitable soil found on-site. In the event a suitable soil cannot be found, a borrow area would need to be identified. This may be discussed during the pre-design meeting. Soil testing would be completed by Tetra Tech's in-house soil laboratory located in Morgantown, West Virginia. Alkaline addition may also be considered if desired by WV DEP to prevent or ameliorate AMD seeping or discharging from the refuse material. Necessary liming, soil supplements, and mulching requirements would be specified in the design to ensure adequate growth of vegetation following grading and seeding of the site.

### **3.2.9 Remediation of spoil/pond**

Impoundments will be dewatered in a controlled manner while also considering the safety of any existing public dwellings and structures downstream of the project areas and impacts to the receiving stream. Based upon the quality of the impounded water, some form of treatment may be necessary or required prior to discharge. Settling ponds, sumps and rock check dams will be positioned between the impoundment and the receiving stream as necessary. Following dewatering activities, the outside berms will be pushed and compacted in specified lifts to final grade. All impacted areas will be revegetated according to the proposed seeding and revegetation plan.

## **3.3 BUFFALO CREEK HIGHWALL**

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Located west of the town of Bethany in Brooke County WV. The goal of this project is remediation of a dangerous highwall, multiple collapsed portals, a dangerous slide, installation of new treatment systems, drainage design, mine spoil, and water impoundments, and crating/upgrading the access roads.

### **3.3.1 Remediation of Highwall**

Unless otherwise indicated, highwalls from former surface mining cuts or deep mine face up areas will be backfilled to approximate original contour using available onsite spoil materials. If inadequate spoil material remains or is available on the site, and alternate final grade may be proposed, or another source of material will be identified. Specifications will be developed indicating compaction requirements such as degree of compaction, lift thickness and other quality control parameters for compaction during highwall reclamation. If any highwalls have significant loose rock or other signs of instability, additional special requirements may be specified to provide for the safety of the contractor's employees and equipment during construction.

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### **3.3.3 Slide Remediation**

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## **Potential Soil Tests**

- Visual Description
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- Standard Proctor
- Atterberg Limits

Plan and cross section views will be developed for the design of the stabilization and remediation of the landslide area. Plan and cross section views will provide the location and design parameters of the final slope configuration and will show the location and details of proposed subsurface drainage underdrains, final slopes, proposed keyways, and typical detail slope saw-cut excavation as part of the reconstructed/stabilized slope. Stability analyses will be completed utilizing the Slide 2 program to assist in determining the stable configuration of the final slope configuration with a minimum standard safety margin of 1.5. Specifications will be developed indicating compaction requirements such as degree of compaction, optimum moisture, plus or minus variance on moisture, lift thickness and other quality control parameters for compaction during construction.

### **3.3.4 Installation of a New Treatment System**

Tetra Tech would request and review all water sample and flow measurement information for the discharge being treated and for the effluent from the current treatment system. If necessary, additional sampling and monitoring may be rerecommended to develop the design flow and discharge water quality chemistry. Based on the design parameters, a new treatment system would be designed using AMDtreat coupled with other design guidelines and Tetra Tech's past experience for similar sites. The treatment system will be evaluated for constructability on the site. If the available land areas or topography is inadequate for the proposed system other options may be proposed for review and approval by WV DEP.

### **3.3.5 Drainage Design**

Drainage areas within the project area will be determined. If possible, diversion ditches will be located in the upstream area in order to control and divert the drainage around the project area. All drainage ditches, swales, underdrains and culverts will be sized and designed in accordance with standard engineering practices. Size, slope, and lining of the proposed ditches and culverts will be specified on the plans and be based on required storm events. Design of drainage conveyances, including drainage channels, underdrains and /or other controls to safely convey water (including mine water) off-site will be designed in accordance with standard engineering practices and will fully consider the safety of the existing public dwellings and structures near the project areas. For mine water conveyance pipelines,



adequate cleanouts will be incorporated to allow for future maintenance of the mine drainage control system. Hydrologic and hydraulic (H&H) analyses will be performed for the site and existing structures. The HydroCAD Stormwater Modeling program will be utilized in analyzing and sizing drainage structures for the project.

### **3.3.6 Remediation of Spoil/Refuse**

Reclamation of spoil and/or coal refuse piles will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Spoil and refuse material shall be regraded and capped with suitable soil found on-site. In the event a suitable soil cannot be found, a borrow area would need to be identified. This may be discussed during the pre-design meeting. Soil testing would be completed by Tetra Tech's in-house soil laboratory located in Morgantown, West Virginia. Alkaline addition may also be considered if desired by WV DEP to prevent or ameliorate AMD seeping or discharging from the refuse material. Necessary liming, soil supplements, and mulching requirements would be specified in the design to ensure adequate growth of vegetation following grading and seeding of the site.

### **3.3.7 Remediation of spoil/pond**

Impoundments will be dewatered in a controlled manner while also considering the safety of any existing public dwellings and structures downstream of the project areas and impacts to the receiving stream. Based upon the quality of the impounded water, some form of treatment may be necessary or required prior to discharge. Settling ponds, sumps and rock check dams will be positioned between the impoundment and the receiving stream as necessary. Following dewatering activities, the outside berms will be pushed and compacted in specified lifts to final grade. All impacted areas will be revegetated according to the proposed seeding and revegetation plan.

### **3.3.8 Access Road Design**

Temporary and permanent access will be designed utilizing AutoCad software. Plan view, designed profile, and roadway cross sections shown at an appropriate interval will be prepared and will be included within the final drawing package. Typical sections will be shown to indicate design features such as roadway cross slopes, pavement composition (gravel, asphalt, or concrete) and thickness, side slopes of embankments/cut slopes and proposed ditching. The roadway will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Final design of the roadway will attempt to design the roadway to a balanced cut/fill situation, if possible. Cut and fill quantities will be listed on the plans.

## **3.4 CRAFTS RUN MAINTENANCE**

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Located east of the town of Madsville, in Monongalia County WV. The goal of this project is remediation of existing drainage systems, multiple portals, a dangerous highwall, sludge remediation, mine spoil, drainage design, and creating/upgrading the access road.

### **3.4.1 Remediation of Drainage System**

Tetra Tech will investigate the existing drainage system to determine how it was originally configured and problems/repairs that may have occurred. Depending on the findings of the investigation a plan for remediation will be developed. This may include repair, replacement or resizing of diversion ditches, conveyances, and underdrains.

### **3.4.2 Remediation of Mine Portal**

Tetra Tech has extensive experience in the development and design of mine portal seals. Designs have included drilling from a location above and at an angle from the proposed seal and injecting designed grout to form the seal blockage and have also utilized polyurethane foam as a portal seal. This technique of designing and developing the portal seal has proven to be more effective and safer than excavating at the portal entry location and then constructing the concrete or concrete block portal seal. Each mine portal, whether open or collapsed, will be evaluated to determine the best method for reclamation. All However, mine portals will be sealed in accordance with WVDEP approved methods. If endangered species are present, such as various bat species, appropriate bat gates or other structures will be incorporated into the project design. Although it is Tetra Tech's understanding, based on information provided by Mike Sheehan, former WVDEP AML&R Program Administrator and current Tetra Tech employee, that the WVDEP's practice for mine openings is to presume presence of endangered bat species. Therefore, appropriate bat gates or other structures will be incorporated into the project design unless instructed otherwise by the WVDEP.

### **3.4.3 Remediation of Highwall**

Unless otherwise indicated, highwalls from former surface mining cuts or deep mine face up areas will be backfilled to approximate original contour using available onsite spoil materials. If inadequate spoil material remains or is available on the site, and alternate final grade may be proposed, or another source of material will be identified. Specifications will be developed indicating compaction requirements such as degree of compaction, lift thickness and other quality control parameters for compaction during highwall reclamation. If any highwalls have significant loose rock or other signs of instability, additional special requirements may be specified to provide for the safety of the contractor's employees and equipment during construction.

### **3.4.4 Sludge Remediation**

Tetra Tech will analyze the volume and percent moisture of the sludge. Depending on WV DEP's requirements, characteristics of the sludge, and site conditions, the sludge could be dried out and buried onsite or potentially removed and incorporated into the backfill of another project or landfilled at a permitted waste disposal landfill.

### **3.4.5 Remediation of Spoil/Refuse**

Reclamation of spoil and/or coal refuse piles will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Spoil and refuse material shall be regraded and capped with suitable soil found on-site. In the event a suitable soil cannot be found, a borrow area would need to be identified. This may be discussed during the pre-design meeting. Soil testing would be completed by Tetra Tech's in-house soil laboratory located in Morgantown, West Virginia. Alkaline addition may also be considered if desired by WV DEP to prevent or ameliorate AMD seeping or discharging from the refuse material. Necessary liming, soil supplements, and mulching requirements would be specified in the design to ensure adequate growth of vegetation following grading and seeding of the site.

### **3.4.6 Drainage Design**

Drainage areas within the project area will be determined. If possible, diversion ditches will be located in the upstream area in order to control and divert the drainage around the project area. All drainage ditches, swales, underdrains and culverts will be sized and designed in accordance with standard engineering practices. Size, slope, and lining of the proposed ditches and culverts will be specified on the plans and be based on required storm events. Design of drainage conveyances, including drainage channels, underdrains and /or other controls to safely convey water off-site (including mine water) will be designed in accordance with standard engineering practices and will fully consider the safety of the existing public dwellings and structures near the project areas. For mine water conveyance pipelines, adequate cleanouts will be incorporated to allow for future maintenance of the mine drainage control system. Hydrologic and hydraulic (H&H) analyses will be performed for the site and existing structures. The HydroCAD Stormwater Modeling program will be utilized in analyzing and sizing drainage structures for the project.

### **3.4.7 Access Road Design**

Temporary and permanent access will be designed utilizing AutoCad software. Plan view, designed profile, and roadway cross sections shown at an appropriate interval will be prepared and will be included within the final drawing package. Typical sections will be shown to indicate design features such as roadway cross slopes, pavement composition (gravel, asphalt, or concrete) and thickness, side slopes of embankments/cut slopes and proposed ditching. The roadway will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Final design of the roadway will attempt to design

the roadway to a balanced cut/fill situation, if possible. Cut and fill quantities will be listed on the plans.

### **3.5 LOGAN RUN HIGHWALL**

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Located southwest of the town of Bethany in Brooke County, WV. The goal of this project is remediation of dangerous highwall, a hazardous waterbody, a clogged stream, drainage design, and creating/upgrading the access roads.

#### **3.5.1 Remediation of Highwall**

Unless otherwise indicated, highwalls from former surface mining cuts or deep mine face up areas will be backfilled to approximate original contour using available onsite spoil materials. If inadequate spoil material remains or is available on the site, and alternate final grade may be proposed, or another source of material will be identified. Specifications will be developed indicating compaction requirements such as degree of compaction, lift thickness and other quality control parameters for compaction during highwall reclamation. If any highwalls have significant loose rock or other signs of instability, additional special requirements may be specified to provide for the safety of the contractor's employees and equipment during construction.

#### **3.5.2 Hazardous Waterbody**

All hazards will be identified and neutralized. These hazards may be in the form of waterbodies beneath hazardous highwalls or a collapsed portal. These hazards will be addressed according to the specific hazard. All impoundments will be dewatered in a controlled manner while also considering the safety of any existing public dwellings and structures downstream of the project areas and impacts to the receiving stream. Based upon the quality of the impounded water, some form of treatment may be necessary or required prior to discharge. Settling ponds, sumps and rock check dams will be positioned between the impoundment and the receiving stream as necessary. Following dewatering activities, the outside berms will be pushed and compacted in specified lifts to final grade. All impacted areas will be revegetated according to the proposed seeding and revegetation plan.

#### **3.5.3 Drainage Design**

Drainage areas within the project area will be determined. If possible, diversion ditches will be located in the upstream area in order to control and divert the drainage around the project area. All drainage ditches, swales, underdrains and culverts will be sized and designed in accordance with standard engineering practices. Size, slope, and lining of the proposed ditches and culverts will be specified on the plans and be based on required storm events. Design of drainage conveyances, including drainage channels, underdrains and /or other

controls to safely convey water (including mine water) off-site will be designed in accordance with standard engineering practices and will fully consider the safety of the existing public dwellings and structures near the project areas. For mine water conveyance pipelines, adequate cleanouts will be incorporated to allow for future maintenance of the mine drainage control system. Hydrologic and hydraulic (H&H) analyses will be performed for the site and existing structures. The HydroCAD Stormwater Modeling program will be utilized in analyzing and sizing drainage structures for the project.

### **3.5.4 Access Road Design**

Temporary and permanent access will be designed utilizing AutoCad software. Plan view, designed profile, and roadway cross sections shown at an appropriate interval will be prepared and will be included within the final drawing package. Typical sections will be shown to indicate design features such as roadway cross slopes, pavement composition (gravel, asphalt, or concrete) and thickness, side slopes of embankments/cut slopes and proposed ditching. The roadway will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Final design of the roadway will attempt to design the roadway to a balanced cut/fill situation, if possible. Cut and fill quantities will be listed on the plans.

## **3.6 RICHARD MINE DRAINAGE FACILITY UPGRADES**

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Located southeast of Morgantown in Monongalia County, WV. The goal of this project is for installation of new fencing, security gates, security cameras, door replacements, reskinning (wall and roofs) of certain existing structures (or demolishing and replacing), repaving and new paving of the road within the sites, and various other facility additions, replacements or upgrades.

### **3.6.1 Upgrades to the facility**

Tetra Tech is currently working on several projects in the area of the Richard Drainage Facility and have good, ongoing working relationships with local contractors. Tetra Tech would work with these local contractors to develop and oversee the upgrades to the property. All proposed work would be coordinated with the WV DEP and all paving and other work would be designed and completed in accordance with WV DEP standards or other approved standards.

## **3.7 WADES RUN DANGEROUS EMBANKMENT**

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Located northwest of the town of Star City in Monongalia County, WV. The goal of this project is remediation of a collapsed portal, mine spoil/gob and refuse piles, sludge remediation, removing multiple dangerous structures, drainage design, trash cleanup, and creating/upgrading the access roads.

### **3.7.1 Remediation of Mine Portal**

Tetra Tech has extensive experience in the development and design of mine portal seals. Designs have included drilling from a location above and at an angle from the proposed seal and injecting designed grout to form the seal blockage and have also utilized polyurethane foam as a portal seal. This technique of designing and developing the portal seal has proven to be more effective and safer than excavating at the portal entry location and then constructing the concrete or concrete block portal seal. Each mine portal, whether open or collapsed, will be evaluated to determine the best method for reclamation. All However, mine portals will be sealed in accordance with WVDEP approved methods. If endangered species are present, such as various bat species, appropriate bat gates or other structures will be incorporated into the project design. Although it is Tetra Tech's understanding, based on information provided by Mike Sheehan, former WVDEP AML&R Program Administrator and current Tetra Tech employee, that the WVDEP's practice for mine openings is to presume presence of endangered bat species. Therefore, appropriate bat gates or other structures will be incorporated into the project design unless instructed otherwise by the WVDEP.

### **3.7.2 Remediation of Spoil/Refuse**

Reclamation of spoil and/or coal refuse piles will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Spoil and refuse material shall be regraded and capped with suitable soil found on-site. In the event a suitable soil cannot be found, a borrow area would need to be identified. This may be discussed during the pre-design meeting. Soil testing would be completed by Tetra Tech's in-house soil laboratory located in Morgantown, West Virginia. Alkaline addition may also be considered if desired by WV DEP to prevent or ameliorate AMD seeping or discharging from the refuse material. Necessary liming, soil supplements, and mulching requirements would be specified in the design to ensure adequate growth of vegetation following grading and seeding of the site.

### **3.7.3 Sludge Remediation**

Tetra Tech will analyze the volume and percent moisture of the sludge. Depending on WV DEP's requirements, characteristics of the sludge, and site conditions, the sludge could be dried out and buried onsite or potentially removed and incorporated into the backfill of another project or landfilled at a permitted waste disposal landfill.

### **3.7.4 Removal of Structures**

Unless directed otherwise by the WVDEP any materials that can be safely and legally buried on-site will be disposed of in this manner, all other materials must be hauled to an appropriate landfill for disposal, weight tickets from the landfill will be required. Derelict equipment shall be

hauled off-site and scrapped. If any structures contain asbestos, they will be evaluated in accordance with National Emission Standards for Hazardous Air Pollutants (NESHAP) standards and in accordance with any state or local requirements. Removal of asbestos will be completed in accordance with all safety precautions and requirements.

### **3.7.5 Trash Removal**

Trash removal will be incorporated into the overall plans for the project and disposed of appropriately. Trash removed from the project site will be taken to an appropriate permitted landfill for disposal.

### **3.7.6 Access Road Design**

Temporary and permanent access will be designed utilizing AutoCad software. Plan view, designed profile, and roadway cross sections shown at an appropriate interval will be prepared and will be included within the final drawing package. Typical sections will be shown to indicate design features such as roadway cross slopes, pavement composition (gravel, asphalt, or concrete) and thickness, side slopes of embankments/cut slopes and proposed ditching. The roadway will be designed in accordance with WVDEP mining and reclamation standards, or other standards as determined by WVDEP. Final design of the roadway will attempt to design the roadway to a balanced cut/fill situation, if possible. Cut and fill quantities will be listed on the plans.

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

**Attachment "A"**

PROJECT NAME EOI - 2023 AML Contract N3		DATE (DAY, MONTH, YEAR) 28, August 2023		FEIN 95-4148514																																					
1. FIRM NAME Tetra Tech, Inc		2. HOME OFFICE BUSINESS ADDRESS 947 Canyon Rd, Morgantown, WV 26508		3. FORMER FIRM NAME																																					
4. HOME OFFICE TELEPHONE 304-212-3600	5. ESTABLISHED (YEAR) 1966	6. TYPE OWNERSHIP Corporation		6a. WV REGISTERED DBE (Disadvantaged Business Enterprise)  NO																																					
7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE Morgantown, 947 Canyon Rd, Morgantown, WV 26508/304-534-4021/Jacquie Brody, PE/ 9 People Pittsburgh, 661 Andersen Dr, Pittsburgh, PA, 15220/412-921-7090/Jacquie Brody, PE/95 People																																									
8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM Mr. Mark Perry, PE - Unit President			8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS Mr. Eric Cavazza, PE - Project Manager - 412-522-9764																																						
9. PERSONNEL BY DISCIPLINE																																									
<table style="width:100%; border:none;"> <tr> <td style="width:33%;">— ADMINISTRATIVE 802</td> <td style="width:33%;">— ECOLOGISTS 219</td> <td style="width:33%;">— LANDSCAPE ARCHITECTS 51</td> <td style="width:33%;">— STRUCTURAL ENGINEERS 98</td> </tr> <tr> <td>— ARCHITECTS 679</td> <td>— ECONOMISTS <u>30</u></td> <td>— MECHANICAL ENGINEERS 788</td> <td>— <b>SURVEYORS 60</b></td> </tr> <tr> <td>— <b>BIOLOGIST 661</b></td> <td>— ELECTRICAL ENGINEERS <u>760</u></td> <td>— <b>MINING ENGINEERS 180</b></td> <td>— TRAFFIC ENGINEERS</td> </tr> <tr> <td>— <b>CADD OPERATORS 522</b></td> <td>— ENVIRONMENTALISTS <u>1943</u></td> <td>— PHOTOGRAMMETRISTS <u>17</u></td> <td>— OTHER 13,714</td> </tr> <tr> <td>— CHEMICAL ENGINEERS 202</td> <td>— ESTIMATORS 240</td> <td>— PLANNERS: URBAN/REGIONAL 648</td> <td></td> </tr> <tr> <td>— <b>CIVIL ENGINEERS 339</b></td> <td>— <b>GEOLOGISTS 443</b></td> <td>— SANITARY ENGINEERS 184</td> <td>— TOTAL PERSONNELL 27,000</td> </tr> <tr> <td>— CONSTRUCTION INSPECTORS 234</td> <td>— HISTORIANS 3</td> <td></td> <td>Personnel Company Wide</td> </tr> <tr> <td>— DESIGNERS 182</td> <td>— HYDROLOGISTS <u>227</u></td> <td>— SOILS ENGINEERS 350</td> <td></td> </tr> <tr> <td>— DRAFTSMEN 200</td> <td></td> <td>— SPECIFICATION WRITERS <u>61</u></td> <td></td> </tr> </table>						— ADMINISTRATIVE 802	— ECOLOGISTS 219	— LANDSCAPE ARCHITECTS 51	— STRUCTURAL ENGINEERS 98	— ARCHITECTS 679	— ECONOMISTS <u>30</u>	— MECHANICAL ENGINEERS 788	— <b>SURVEYORS 60</b>	— <b>BIOLOGIST 661</b>	— ELECTRICAL ENGINEERS <u>760</u>	— <b>MINING ENGINEERS 180</b>	— TRAFFIC ENGINEERS	— <b>CADD OPERATORS 522</b>	— ENVIRONMENTALISTS <u>1943</u>	— PHOTOGRAMMETRISTS <u>17</u>	— OTHER 13,714	— CHEMICAL ENGINEERS 202	— ESTIMATORS 240	— PLANNERS: URBAN/REGIONAL 648		— <b>CIVIL ENGINEERS 339</b>	— <b>GEOLOGISTS 443</b>	— SANITARY ENGINEERS 184	— TOTAL PERSONNELL 27,000	— CONSTRUCTION INSPECTORS 234	— HISTORIANS 3		Personnel Company Wide	— DESIGNERS 182	— HYDROLOGISTS <u>227</u>	— SOILS ENGINEERS 350		— DRAFTSMEN 200		— SPECIFICATION WRITERS <u>61</u>	
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— DRAFTSMEN 200		— SPECIFICATION WRITERS <u>61</u>																																							
<p><b>TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: <u>9</u></b></p> <p><b>*RPEs other than Civil and Mining must provide supporting documentation that qualifies them to supervise and perform this type of work.</b></p>																																									
10. HAS THIS JOINT-VENTURE WORKED TOGETHER BEFORE? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO																																									



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

<p>NAME AND ADDRESS:                  Monaloh Basin Engineers                  300 Buisness Centers Drive, Suite 304                  Pittsburgh, PA 15205</p>	<p>SPECIALTY: Surveying Services</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">___X___ Yes                  ___ No</p>
<p>NAME AND ADDRESS:                  Core Drilling, LLC                  620 Lincoln Avenue                  Bentleyville, PA 15314</p>	<p>SPECIALTY: Geotechnical Drilling</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">__X__ Yes                  No</p>
<p>NAME AND ADDRESS:                  Geotechnics                  544 Braddock Avenue                  East Pittsburgh, PA 15112</p>	<p>SPECIALTY: Soil Testing</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">__X__ Yes                  No</p>
<p>NAME AND ADDRESS:                  Mon Valley Integration                  PO Box 247                  Dellslow, WV, 26531</p>	<p>SPECIALTY: Instrumentation and Controls</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">__X__ Yes                  No</p>
<p>NAME AND ADDRESS:</p>	<p>SPECIALTY:</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">___ Yes                  No</p>
<p>NAME AND ADDRESS:</p>	<p>SPECIALTY:</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">___ Yes                  No</p>
<p>NAME AND ADDRESS:</p>	<p>SPECIALTY:</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">___ Yes                  No</p>
<p>NAME AND ADDRESS:</p>	<p>SPECIALTY:</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">___ Yes                  No</p>
<p>NAME AND ADDRESS:</p>	<p>SPECIALTY:</p>	<p>WORKED WITH BEFORE</p> <p style="text-align: center;">___ Yes                  No</p>

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

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

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B. Is your firm experienced in Soil Analysis?

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

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C. Is your firm experienced in hydrology and hydraulics?

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

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

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

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

YES Description and Number of Projects: Tetra Tech's large size and extensive resources provides for skilled individuals in various disciplines, Tetra Tech does have experience in domestic waterline design in conjunction with other projects.

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

YES Description and Number of Projects: Tetra Tech has a whole team dedicated to Acid Mine Drainage projects, we are currently working on 12 projects specifically looking at AMD treatment with 10+ projects completed in the last 5 years.

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

NAME & TITLE (Last, First, Middle Int.) Cavazza, Eric E. P.E.	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 38	YEARS OF AML RELATED DESIGN EXPERIENCE:38	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

**Brief Explanation of Responsibilities**  
 Mr. Eric Cavazza has over thirty-eight (38) years of extensive experience administering state and federal environmental programs including extensive experience managing the development, design and construction of environmental restoration projects to eliminate hazards and restore environmental degradation associated with abandoned mine lands. He served as the Design Section Chief in the PA AML Programs Cambria Office for 17 years, and served as Pennsylvania's AML Program Director for 9 years before retiring from there in December 2020.

**EDUCATION (Degree, Year, Specialization)**  
 BS, 1983 Mining Engineer/ M Eng, 1995 Environmental Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS SME, ASRS	REGISTRATION (Type, Year, State) PE in PA (1989); PE in WV (2023); PE in KY (2023), PE in OH (2023), and PE in IN (2023)
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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.) Hynes, Gregory PE	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 32	YEARS OF AML RELATED DESIGN EXPERIENCE:32	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

**Brief Explanation of Responsibilities**  
 Mr. Hynes has 32 years of professional engineering experience including utility pipelines and abandoned mine land reclamation. Additionally, he has designed and permitted numerous mine surface facilities, oil and gas well pad sites, potable water distribution systems, stormwater conveyance systems, sanitary sewerage systems, and developed E&S control plans.

**EDUCATION (Degree, Year, Specialization)**  
 BE, 1987 Civil Engineer/ MS, 1997 Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS SME	REGISTRATION (Type, Year, State) PE 1993 PA, PE 1998 OH, PE 1998 WV
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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.) Jackson, Randy, PE	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 35	YEARS OF AML RELATED DESIGN EXPERIENCE:35	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

**Brief Explanation of Responsibilities**  
 Mr. Jackson has deep expertise in Abandoned Mine Lands (AML) reclamation including seven years of Project Development experience and 28 years of experience in Project Design. Mr. Jackson currently assists with various engineering tasks related to reclamation projects.

**EDUCATION (Degree, Year, Specialization)**  
 BS, 1987 Civil Engineer

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State) PE 1993 PA, PE 2023 OH, PE 2023 WV
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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.) Kudlawiec, Robert, PE	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 47	YEARS OF AML RELATED DESIGN EXPERIENCE:15	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

**Brief Explanation of Responsibilities**  
 A dedicated Professional Engineer and Executive with extensive experience in all facets of mining engineering, operation, financial analysis, due diligence, and management, from concept to reclamation. Also has a proven track record of executive business leadership, team building, project design, subsidence investigation, environmental compliance, and a passion for innovation and raising the performance of employees.

**EDUCATION (Degree, Year, Specialization)**  
 BS, 1979 Mining Engineer/MBA 1988

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS SME, Pittsburgh Coal Mining Institute of America	REGISTRATION (Type, Year, State) PE 1984 PA, PE 2007 OH, PE 1997 WV, PE 2004 KY
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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.) Sheehan, Mike	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 26	YEARS OF AML RELATED DESIGN EXPERIENCE: 26	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

Brief Explanation of Responsibilities  
 Mr. Mike Sheehan has over twenty-six (26) years of extensive experience in mining reclamation, including fourteen (14) years administering state environmental programs including extensive experience managing the development, design and construction of environmental restoration projects to eliminate hazards and restore environmental degradation associated with abandoned mine lands, forfeited mine lands and abandoned landfills.

EDUCATION (Degree, Year, Specialization)  
 BS, 1993, Environmental Protection Science

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

REGISTRATION (Type, Year, State)

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.) Yost, Gregory P.G.	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 13	YEARS OF AML RELATED DESIGN EXPERIENCE: 13	YEARS OF DOMESTIC

Brief Explanation of Responsibilities  
 Mr. Yost has experience with subsurface geotechnical investigations, including utilizing the information obtained to implement in foundation design. Additionally, Mr. Yost has construction experience comprising of well pads and compressor pads, pipeline right-of-way remediation, and landslide remediation. His experience also encompasses the evaluation of slope stability applied to cut slopes, fill slopes, and landslide susceptible slopes. Mr. Yost has experience analyzing rock formations for depositional environment, strike, dip, and rock structure including joints, faults, and discontinuities. Mr. Yost has experience with identifying and flagging wetland areas and performing investigation in determining contamination of both water and soil.

EDUCATION (Degree, Year, Specialization)  
 BS, 2009, Geology

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

REGISTRATION (Type, Year, State)  
 PG, 2015 PA

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:
Trexler, Heather, PG	19	19	

**Brief Explanation of Responsibilities**  
 Ms. Trexler has over 18 years of professional experience with responsibilities for proposal preparation, staff oversight, job and budget tracking, technical report preparation, and client development for coal mining, natural gas and environmental projects. She is the Department Manager of the Energy and Natural Resources Group in the Pittsburgh office and leads projects requiring a multi-disciplinary team of professionals including engineering, geology, hydrogeology, and ecology. Projects activities for coal mining development include mine abandonment designs and the preparation of permits to state agencies in Pennsylvania and West Virginia for mine expansions and associated surface activities. Additional technical projects include the evaluation of current and potential mine pools and reviewing current and potential impacts to water resources.

**EDUCATION (Degree, Year, Specialization)**  
 BS, 2001, Geology MS, 2003, Geology

<b>MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS</b> SME	<b>REGISTRATION (Type, Year, State)</b> PG, 2007 PA, PG, 2023 KY
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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:
Kearns, Michael PE,MS.	26	26	41

**Brief Explanation of Responsibilities**  
 Mr. Kearns has 40 years of professional engineering experience including diverse experience in the mining industry, utility pipelines, abandoned mine land reclamation. Additionally, he has designed and permitted numerous mine surface facilities, oil and gas well pad sites, potable water distribution systems, stormwater conveyance systems, sanitary sewerage systems, site development for industrial and commercial facilities, slope remediation analyses and has developed E&S control plans for hundreds of facilities.

**EDUCATION (Degree, Year, Specialization)**  
 BS Civil Engineering 1977, MS Civil Engineering 1982

<b>MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS</b> ASCE(Life Member), NSPE	<b>REGISTRATION (Type, Year, State)</b> PE - WV (1981), OH (1991), PA (1992), MD (2021)
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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		
Patterson, John, PE	YEARS OF AML DESIGN EXPERIENCE: 15	YEARS OF AML RELATED DESIGN EXPERIENCE: 6	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:

**Brief Explanation of Responsibilities**  
 John Patterson is a Civil/Environmental Engineer with more than 15 years of experience in pipeline, AMD and site permitting, and stormwater design. His knowledge and background of erosion and sediment control design, stormwater control design, NPDES permit applications, and civil site design provide a wide platform of experience and skills to draw from when creating permit applications. Mr. Patterson has created and designed multiple pipeline and site projects in Civil3D, adding to his experience in engineering design. John has also observed various forms of construction in the field.

**EDUCATION (Degree, Year, Specialization)**  
 BS Civil & Environmental Engineering 2007

<b>MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS</b>	<b>REGISTRATION (Type, Year, State)</b> PE -PA (2016)
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14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES

Microsoft Office Professional and Microsoft Project

Bentley Pond Pack (Haestad methods)

Adobe Photoshop

Adobe Acrobat

AutoCAD Map 3D

AutoDesk Civil 3D

ESRI ArcGIS

ESRI ArcView

Bentley Flow Master (Haested Methods)

Bentley HEC-Pack

STBL5M

Groundwater Vistas

GMS

Autodesk Storm and Sanitary Analysis

Hydro CAD

SLIDE II STABILITY ANALYSIS PROGRAM

Carlson Survey



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
2022 WV AML Contract 9, Preston, Tucker, Grant and Monongalia Counties, WV	WVDEP AML 101 Cambridge Place Bridgeport, WV 26330	Prime Contractor	\$7.8 Million	5%
Pell Road Doser Upgrade Project, Preston County WV	WVDEP AML 101 Cambridge Place Bridgeport, WV 26330	Prime Contractor	\$750,000	80%
Gladden AMD Treatment Plant, South Fayette Township, Allegheny County PA	South Fayette Conservation Group 515 Millers Run Road Morgan, PA 15064	Prime Contractor	\$13.5 Million	99%
WVDEP OSR Royal Coal Bond Forfeiture Fayette County WV	WVDEP OSR 1159 Nick Rahall Greenway Fayetteville, WV 25840	Prime Contractor	\$250,000	95%
Banning/WNCL Coal Refuse Pile and Slurry Impoundments, Design and Permitting Westmoreland Cnty., PA	Pennsylvania Department of Environmental Protection 400 Market Street Harrisburg, PA 17102	Prime Contractor	\$30,000,000	5%
Glenn Springs Holdings Bird Mine Treatment, Tire Hill Pennsylvania	Glenn Springs Holdings 5 Greenway Plaza, Suite 10 Houston, TX 77046	Prime Contractor	Confidential	Ongoing
Quakake Treatment Plant Carbon County Pennsylvania	PADEP BAMR 2 Public Square 5 <sup>th</sup> Floor Wilkes-Barre, Pennsylvania 18701	Prime Contractor	\$1.2 Million	95%
Blacklick Creek Treatment Facility	PADEP BAMR 400 Market Street Harrisburg, PA 17106	Prime Contractor	\$1.9 Million	75%
TOTAL NUMBER OF PROJECTS: Tetra Tech is currently conducting thousands of projects nationwide for the purpose of the EOA only a sample is provided			TOTAL ESTIMATED CONSTRUCTION COSTS: \$+15 Million	



17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD				
PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
WV Land Stewardship Larosa Fuels Marion County WV	WV Land Stewardship Corporation 709 Beechurst Ave Morgantown, WV 26505	\$136,000	2018	Yes
Dolph Underground Mine Fire, Lackawanna County, PA	PADEP BAMR 400 Market Street Harrisburg, PA 17106	\$15 Million	2018	Yes
Wingfield Pines Inflow Reconstruction Project, Upper St. Clair Township, Allegheny County PA	Allegheny Land Trust 416 Thorn Street Sewickley, PA 15143	\$1 Million	2019	Yes
Kempton Sludge Disposal Line Garrett County MD	Maryland Department of the Environment 160 S Water Street Frostburg, MD 21532	\$385,000	2019	Yes
Jennings Run Doser, Design, Allegany County, MD	Maryland Department of the Environment 160 S Water Street Frostburg, MD 21532	\$59,000	2023	Yes
Banning/WNCL Coal Refuse Pile and Slurry Impoundments, Alternatives Analysis, Westmoreland County, PA	Pennsylvania Department of Environmental Protection 400 Market Street Harrisburg, PA 17102	\$30,000,000	2022	Not Yet, In Final Design
Buffalo Coal Mt. Storm, WV	WV Land Stewardship Corporation 709 Beechurst Ave Morgantown, WV 26505	\$269,170	2018	Yes
Rausch Creek Treatment Plant Upgrades Schuylkill County PA	PADEP BAMR 2 Public Square 5 <sup>th</sup> Floor Wilkes-Barre, Pennsylvania 18701	\$200,000	2018	Yes
Tetra Tech had conducted thousands of projects nationwide for the purpose of the EOA only a sample is provided				

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH
NA	NA	NA	NA	NA	NA

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.  
 Tetra Tech has extensive knowledge and vast resources to allow for a comprehensive approach to any problem. Tetra Tech works extensively with Abandoned Mine Lands and is well versed on solutions to any problem. Tetra Tech has a strong presence in West Virginia in Morgantown, Fairmont and Charleston, with offices in Pittsburgh, PA and St. Clairsville, OH regularly performing work in the state. The Tetra Tech Pittsburgh office has worked with WVDEP on several Special Reclamation projects throughout the state. Tetra Tech is also working on the design of AML projects with the PA, OH, and KY AML Programs.

20. The foregoing is a statement of facts.

Signature:



Date: 08-28-2023

Title: Project Manager

Printed Name: Eric E. Cavazza

AML and RELATED PROJECT EXPERIENCE MATRIX																								
PROJECT	Exp. Basis C=Corp. P=Personnel *	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS														PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional							
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/Nitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	Eric Cavazza, PE	Gregory Hynes, PE	Gregory Yost, PG	Michael Kearns PE	Other Project Team Personnel	Other Tetra Tech Personnel	
PADEP Gladden Acid Mine Drainage Treatment Plant	C&P	Yes		X		X					X	X	X	X		x	X	M	P	p	P	P	M	
2022 WVDEP AML Contract 9	C&P	Yes				X					X	X	X	X			x	M	p	P	M	P	M	
WVDEP OSR Royal Coal Bond Forfeiture	C&P	Yes	X			X					x						X				P	P	M	
WVDEP Pell Run Doser	C&P	Yes				X					X			X		X	X				P	P	P	M
Jennings Run Doser	C&P	Yes				X					X	X	X	X			X				P		P	M
PADEP Black Lick Creek	C&P	Yes			X	X					X			X			X					M	P	M
PADEP Dolph Mine Fire	C&P	Yes				X		X															P	P
PADEP Rausch Creek	C&P	Yes											X	X									P	P
WVDEP OSR Frush Enterprises Bond Forfeiture	C&P	Yes	X														X						P	P
WVLSL Larosa Fuels	C&P	Yes	X			X						X		X	X				M				P	P
Glenn Springs Holdins Bird Mine Treatment	C&P	Yes				X			X		X	X	X	X			X	M	P	P			P	P
Banning Coal Refuse Pile & Slurry Impoundments	C&P	Yes	X			X	X	X			X	X			X		X	M/P		P			P	P
WVLSL Buffalo Coal	C&P	Yes	X			X						X		X					M				P	P

\* List whether project experience is corporate or personnel based or both.

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

\*\*\* List Primary Design personnel and their functional capacity for the projects listed.