December 5, 2019

Lycoming County Controller’s Office
Lycoming County Executive Plaza Building
330 Pine Street, 2nd Floor
Williamsport, PA 17701

Attn: County of Lycoming Representatives

Re: Request for Qualifications (RFQ)
Williamsport Region Relief Well Rehabilitation and Replacement Project

Dear County of Lycoming Representatives:

Geo-Technology Associates, Inc. (GTA) is pleased to submit our Statement of Qualifications (SOQ) for the above-referenced project. We understand that a total of 59 wells will need to be rehabilitated or replaced in their entirety which includes permits, well drilling, well screen, bentonite seals, concrete seals, riser pipe, filter pack, well development, and pumping tests and outlet works. Information requested for inclusion in this letter follows:

Prime Firm
Business Name: Geo-Technology Associates, Inc.
Address: 3445-A Box Hill Corporate Center Drive, Abingdon, MD 21009
Business Type: Corporation

Roles of Team-member Firms
Geo-Technology Associates, Inc. ............................................... Overall Project Management, Testing, Analysis, Development/Rehabilitation and Reporting
*Ziegenfuss Drilling, Inc. ...................................................... Well Drilling and Installation
*Shannon & Wilson, Inc. ........................................................ Rehabilitation

Single Point of Contact Information
Contact Person: Paul S. Scott, P.G.
Address: 3445-A Box Hill Corporate Center Drive, Abingdon, MD 21009
Telephone: 410-515-9446 (office) / 410-458-8521 (cell) Fax: 410-515-4895
Email Address: pscott@gtacom.com

We value the opportunity to provide you with this SOQ package. As required, an original and five (5) complete copies of our qualifications are provided herein. Should you have any questions or require additional information, please contact the undersigned at your convenience.

Sincerely,

GEO-TECHNOLOGY ASSOCIATES, INC.

Paul S. Scott, P.G.
Vice President

PSS/pld
S:\Marketing\19-427 Williamsport Region Relief Well Rehab RFQ, Lycoming, PA - PSS DSK/Cover Letter.doc

* Team members may change dependent upon specifications for well construction, rehabilitation/drilling methods in the RFP, and/or based upon USACE requirements.

3445-A Box Hill Corporate Center Drive, Abingdon, MD 21009 (410) 515-9446 Fax: (410) 515-4895

Visit us on the web at www.gtacom.com
A. EXECUTIVE SUMMARY

Geo-Technology Associates, Inc. (GTA), incorporated in 1985, is a professional services firm specializing in providing multi-disciplinary solutions to geotechnical, hydrogeologic, natural resource, and environmental industry problems.

Understanding

GTA understands that this project will consist of the rehabilitation or replacement of 59 levee relief wells. Relief wells are to be rehabilitated in accordance with USACE EM 1110-2-1914, and replacement wells are to be drilled in accordance with USACE EM 1110-1-1807. GTA understands that after Hurricane Katrina in 2005, the Federal Emergency Management Agency (FEMA) required that municipalities, protected by levees, meet the “Criteria for Levee Accreditation” for flood insurance mapping. The work requested for this project is part of a continued effort to satisfy these requirements. GTA understands that the Greater Williamsport Levee is responsible for the protection of more than $4 billion in economic assets, and thus an effective and time-efficient strategy must be implemented for the completion of this project.

Based on information currently available, GTA understands that prior evaluation of the 59 relief wells in question indicates that 24 of the wells may respond to rehabilitation efforts, and 35 wells will likely have to be replaced.

Implementation Plan

GTA will utilize its experience in multi-disciplinary project design, specifically with regard to hydrogeologic and well drilling/rehabilitation practices, as well as innovative approaches to perform the services requested for this project. GTA specializes in well rehabilitation and well design, and also specializes in the evaluation of well performance through hydraulic testing, e.g., pumping and step-drawdown tests, and down-hole video evaluation. GTA also has extensive experience working with and managing drilling and well rehabilitation subcontractors. When it is necessary to retain a subcontractor for a project, a GTA representative is on site to direct the work. GTA works closely with subcontractors, for example to evaluate encountered subsurface materials and refine well installation in response to encountered conditions.

Our planning approach includes initial meetings and discussions with our Client with the aim to develop an understanding and efficient way forward in regards to logistics, minimization of impacts to areas proposed for rehabilitation, drilling and testing, etc. GTA will develop a drilling program plan (DPP) and overall work plan outline to share with Client and for submittal to USACE for their review. GTA will coordinate as applicable with USACE and our Client for response to comments, refinement of workplan/DPP and agreement on methods, approach and implementation.

Once work is initiated, GTA will provide periodic status reports to keep the Client apprised of the progress of field operations. Upon the completion of rehabilitation, new well installation, and applicable hydraulic testing, etc., a report that summarizes the results of the work will be prepared for review by our Client and USACE.

Project Approach

Well Rehabilitation

With regard to well rehabilitation, GTA plans to implement a combination of industry-standard methods such as brushing, surging and over-pumping. The success of these methods is variable and dependent on well and formation conditions. GTA also has previous experience and success with the Hydropuls® rehabilitation method. On other well rehabilitation projects, GTA has experienced increases in well specific capacity of up to about 330% using the Hydropuls® method; this method was previously approved by the USACE and may significantly decrease the duration of rehabilitation efforts. Additional information on this method follows.

In 2010, GTA was contracted by the USACE to perform pump testing and rehabilitation on 34 relief wells along the toe of the Curwensville Dam, located in Clearfield County, Pennsylvania. The original scope of work included:
flushing each well for 4-hours, chemical treatment and chemical disposal, brushing, and surging. GTA recommended an innovative approach, that saved a considerable amount of money and eliminated the disposal of thousands of gallons impacted water. This approach relied on the Hydropuls® development method. Hydropuls® uses a nitrogen fired piston that is inserted into the well and creates a shockwave that can penetrate through the filter pack around the well screen, and transfer into the adjacent formation. This process can loosen fine grained materials, which can then be pumped or airlifted from the well.

On the Curwensville project, six wells were chosen to be pump tested before and after using Hydropuls®: four were overburden wells, and two were rock wells. After Hydropuls® rehabilitation, the specific capacity increased up to 330% in the tested wells, with an average increase of about 147%. For the Curwensville project, USACE approved the use of in-well data loggers to measure water levels during development and rehabilitation. This method provided almost continuous water level readings. GTA’s alternate methods saved time and money during the sitework and data processing.

If GTA is selected to provide a proposal for the Williamsport Region Relief Well project, we will include Hydropuls® as an option, and would team with Shannon & Wilson, Inc., to provide these services.

**Well Replacement**

The RFQ indicated that drilling will be performed using the reverse-rotary method. The term reverse rotary is, in our experience, often considered to be reverse-circulation drilling (RCD). RCD is typically used to drill deep wells that require relatively very large diameter drill holes. This method can be relatively complicated, costly, and requires large volumes of water. Also, starting a RCD hole from ground surface is challenging as the drilling rig may need to be elevated.

GTA has reviewed USACE guidance and understands that the ultimate goal is to drill boreholes such that formation impacts are minimized and also to avoid negatively impacting well specific capacity, e.g., by minimizing drilling fluid input. GTA can offer various drilling methods, and will offer the dual-tube rotary drilling method as an option. This method uses an outer casing and an inner drill string, which are advanced simultaneously. The drill string conveys air, which carries drill cuttings to the surface between the drill string and the outer casing. Similar to the reverse rotary/RCD drilling method, dual-tube rotary drilling helps to minimize impact on the surrounding formation, but without the need for large quantities of water. This method is also less cumbersome in terms of equipment requirements, potentially reducing complications due to poor drilling-site access.

Based on information provided, GTA assumes that the replacement wells will be 12-inches in diameter, which will require an 18-inch to 20-inch diameter borehole, and that borings may generally range from about 30 to 50 feet deep.

If the dual tube rotary method is chosen, GTA plans to team with Ziegenfuss Drilling, Inc. Ziegenfuss Drilling, a family owned company, has been in business since 1973, operates in Pennsylvania and is considered by many to be one of the premier large diameter dual-rotary drillers in the country. They operate approximately 17 dual-rotary drill rigs, including 10 Barber DR-24 truck mount rigs and 3 Casa Grande C8 track mounted rigs.

**Well Evaluation**

GTA offers a wide array of well testing and evaluation services. GTA has previously performed levee relief well evaluation services at Williamsport and South Williamsport, including visual inspection, hydraulic testing, specific capacity analysis and down-hole video surveys. GTA anticipates that these services will be applied for this project to evaluate rehabilitation effectiveness and the specific capacity of new wells.

**Master Schedule**

GTA acknowledges that providing a schedule, which includes milestone and completion dates for tasks and phases of work associated with this project will be necessary. After reviewing, and carefully considering currently available information, we do not believe that there is currently sufficient information to provide a firm schedule. However, we do herein provide general scheduling information with assumptions and notation of some items that are needed in
order to provide a more firm schedule. It is noted that unknowns such as the USACE time to review and consider proposed DPP information, as well as their particular specifications for drilling, rehabilitation and testing will likely substantially influence the schedule. This schedule information and the scheduling information in Item G. of this SOQ are preliminary and subject to change.

In our opinion, the determining factor for the amount of time it would take to complete each task or phase of the work, will be primarily based on the means and methods ultimately accepted and approved by USACE. There are also many other unknowns that will drive production rates such as: effort needed to mobilize the drill rig to each well location; well development and rehabilitation pump testing and criteria for cessation of these activities; and, development methods. Additionally, the opportunity to meet with and discuss logistics and priorities of the Client will also help to shape the schedule.

Our general plan would be to first perform the well rehabilitation services, and evaluation of effectiveness via hydraulic testing to identify wells that may not respond to rehabilitation. After substantial well rehabilitation progress, or after rehabilitation completion, well drilling and installation would commence, including the wells initially targeted for replacement along with replacement of wells that are deemed not to respond sufficiently to rehabilitation (if applicable).

GTA would plan to mobilize and begin well rehabilitation within the first several weeks of work initiation. During the first week, an initial depth sounding and water level survey would be performed for wells targeted for rehabilitation. We are currently assuming that the well rehabilitation effort will be limited to no more than 8-hours per well.

Well drilling and installation preparation would include Client staking/or selection of locations, well permitting, utility clearance, and preparation of drilling locations for access. This work would be planned to occur in the initial few weeks after project initiation, but may be in part dependent upon agency review in regards to necessary approvals/permits. Well drilling and installation once underway may consume 2 to 3 days per well assuming implementation of the dual tube method. Well development would commence as soon as practicable following installation of wells, and it is assumed that development of newly installed wells will not exceed about 4-hours per well.

See Item G. of this SOQ for preliminary estimates of the performance time associated with project tasks. Again, we ask that you understand that this schedule discussion, and the scheduling information in Item G. of this SOQ, is preliminary and based on partial information, and will be subject to change as the scope of work is refined.
B. TEAM BACKGROUND INFORMATION

Paul Scott, P.G., is a Hydrogeologist and Vice President with GTA, and will be intimately involved with this project as the Project Manager. Paul will be your single point of contact for this contract, and he works out of GTA’s Abingdon, Maryland office.

GTA, incorporated in 1985, is a professional services firm specializing in geotechnical engineering; hydrogeology; drilling services, environmental consulting; natural resources consulting; and materials testing. GTA currently employs over 375 engineers, scientists, technicians, drillers, and support personnel within 15 offices located throughout the mid-Atlantic region and Carolinas. GTA performs levee relief well services, subsurface investigations, groundwater resource exploration/aquifer testing, structural analyses, and addresses environmental issues from investigation through remediation for contaminated water and soil. The firm also assists clients through risk identification and management as a client advocate.

With multiple regional/Pennsylvania offices and a team of Pennsylvania certified professionals, our staff regularly corresponds with USACE, PADEP, and Environmental Protection Agency (EPA) personnel. GTA maintains a strong presence in Pennsylvania with two offices - in York and Quakertown - and ongoing field operations in western Pennsylvania in relation to the natural gas industry.

GTA’s geologists and engineers are licensed to practice in the mid-Atlantic states (including Pennsylvania) and hold memberships in the American Society of Civil Engineers, National Society of Professional Engineers, National Groundwater Association, and several other professional societies. GTA’s technicians have certifications and/or memberships in the National Institute for Certification in Engineering Technologies (NICET), American Concrete Institute (ACI), International Code Council (ICC), American Welding Society (AWS), and regional agencies such as WACEL, DNREC, and NJDCA. GTA’s engineering and field personnel are supported by our in-house AASHTO Materials Reference Laboratory (AMRL), Cement and Concrete Reference Laboratory (CCRL), Washington Area Council of Engineering Laboratories, and/or U.S. Army Corps of Engineers (USACE) accredited soil, aggregate, and concrete laboratory facilities.

In order for your project to have a successful outcome, we have assembled the potential team-member firms listed below. Our previous working relationship with purveyors of Hydropuls® services is indicated in Item A of this SOQ. We are not aware of conflicts of interest that may exist for GTA or our sub-consultants.

Potential Subcontractors

ZIEGENFUSS DRILLING, INC.
Well Drilling and Installation

Ziegensfuss Drilling, a family-owned company, has been in business since 1973, operates in Pennsylvania and is considered by many to be one of the premier large diameter dual-rotary drillers in the country. They operate approximately 17 dual-rotary drill rigs, including 10 Barber DR-24 truck mount rigs and 3 Casa Grande C8 track mounted rigs. Please refer to Appendix D for additional information on this firm and/or visit their website: www.ziegensfussdrilling.com
SHANNON & WILSON, INC.
Hydropuls® Well Rehabilitation

Shannon & Wilson (S&W) is a nationally recognized consulting firm dedicated to providing quality services in the field of hydrogeology and water resources. Our staff and team members have the experience and specialized expertise required for this relief well rehabilitation project. We have completed numerous projects with similar scopes of work for other levee districts and the several USACE Districts across the country. In addition, S&W staff have performed well rehabilitation work on over 1000 wells since 2001. Please refer to Appendix D for additional information on this firm and/or visit their website: www.shannonwilson.com

C. STAFFING / MANAGEMENT PLAN

GTA has extensive experience, over our many years in business, managing large complex projects with multiple subcontractors and across multiple disciplines. As indicated in the sample project descriptions in Item F. of this SOQ, our field crews and management team have substantial experience on levee relief well projects of large scope and magnitude. Additional examples of our large project capabilities include: our hydrogeologic group has recently successfully performed large-scale Class V well stormwater inflow projects with subcontractors including air rotary drillers, water haulers, frac tank and conveyance system providers, pump/generator providers and water quality laboratories; and, our environmental remediation group routinely manages multiple subcontractors simultaneously for contamination remediation/removal projects. GTA has a strong track record of successfully managing projects of large scope and magnitude similar to this Williamsport Region project.

GTA will maintain a management field presence throughout the course of work including during rehabilitation, testing/evaluation and well replacement, and will draw on our multidisciplinary staff as necessary for performance of tasks such as well development, testing, mechanical rehabilitation, etc. The Organizational Chart in Item D. of this SOQ indicates the general flow of oversight/supervision and key components of the staffing/management plan. GTA incorporates a feedback loop of communications up and down the chain of groups in the organizational chart. For example, our Field Supervisors will be in the field with the drilling/rehabilitation groups, working to proactively implement the scope of work, and reacting to encountered subsurface conditions (with well design refinements, etc.) as the project progresses. Our Field Supervisors have extensive experience managing well subcontractors; they will document progress and provide detailed information on well rehabilitation/replacement to the Project Manager, who will in turn provide updates and discuss progress as needed with the Client.
E. PROFESSIONAL QUALIFICATIONS

Below is a summary of team-members who are proposed for this project. Resumes are provided in Appendix C and include information regarding each person's overall experience, expertise, education, and training, as well as a listing of relevant project experience. As indicated in the resumes and in Item F., GTA has substantial levee work experience.

KEY STAFF

<table>
<thead>
<tr>
<th>Name</th>
<th>Title / Role</th>
<th>Company</th>
<th>Years of Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul S. Scott, P.G.</td>
<td>Vice President / Project Management,</td>
<td>GTA</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Project Administration, Executive Management</td>
<td></td>
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</tr>
<tr>
<td>David S. Krahl</td>
<td>Associate / Quality Control, Subcontractor</td>
<td>GTA</td>
<td>34</td>
</tr>
<tr>
<td>Richard Lake</td>
<td>Subcontractor Administration</td>
<td>GTA</td>
<td>23</td>
</tr>
<tr>
<td>Michael V. Whiteman</td>
<td>Associate / Environmental Compliance Manager</td>
<td>GTA</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Director of Safety / Site Health and Safety Officer</td>
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</tbody>
</table>

SUPPORT STAFF AND SUBCONSULTANTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Title / Role</th>
<th>Company</th>
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</thead>
<tbody>
<tr>
<td>Michael Yamrick, Jr.</td>
<td>Project Hydrogeological Professional / Field Supervisor</td>
<td>GTA</td>
</tr>
<tr>
<td>Gregory McKee</td>
<td>Project Hydrogeological Professional / Field Supervisor</td>
<td>GTA</td>
</tr>
<tr>
<td>Mark Ziegenfuss</td>
<td>Principal / Well Drilling Manager</td>
<td>Ziegenfuss Drilling</td>
</tr>
<tr>
<td>Jim Bailey, LHG</td>
<td>Senior Associate / Task Manager, Hydropuls</td>
<td>Shannon &amp; Wilson</td>
</tr>
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F. SPECIALIZED EXPERIENCE & REFERENCES

GTA has extensive experience with levees, dams and impoundments, including rehabilitation of existing problematic dams and levees and associated relief wells. Our experience includes earthen dams as well as masonry and concrete retaining structures, with problems including seepage, slope sloughing, and settlement. Rehabilitation methods that have been incorporated into dams include soil bentonite cut-off trenches, relief wells, toe drains, grouting, replacement of deteriorated spillways and outlet barrels, and roller compacted concrete. GTA has provided engineering consulting and permitting for many new dam and impoundment facilities. The services included analyses for stability, seismic stability, liquefaction, ground improvement, settlement, drainage, and overtopping. GTA has also developed and installed instrumentation and monitoring programs including piezometers, inclinometers, geophones, vibration sensors, and groundwater monitoring wells.

A sampling of our specialized experience with levees and levee relief well projects follows. It is noted that the specialized experience project descriptions also incorporate information on references requested in the RFQ.
G. PROJECT SCHEDULE

The bullet items provided below indicate general potential schedule information based on limited available information at this time; this schedule information is preliminary and subject to change. It is anticipated that about 30 to 40% of the overall team resources indicated as dedicated to this project will be in play for the well rehabilitation phase, and that about 40 to 60% may be utilized during well drilling/development. This schedule information indicates a longer time frame than anticipated in the RFQ, and does not include potential delays associated with access to sites due to weather or other conditions. This schedule assumes limited overlap of rehabilitation and well drilling, and one crew assigned to each task during business days. A more compressed schedule may be achievable with additional crews/drilling rigs assigned simultaneously which GTA is willing to consider, although this can intensify logistical challenges and can potentially influence costs.

Preliminary Schedule Information in Terms of Weeks Following Authorization to Proceed:

- **Weeks 1 – 4:**
  - Meet with Client, discuss project details and reconnoiter well sites.
  - Water level and Sounding Survey.
  - Prepare DPP and overall workplan and submit to USACE.
  - Client staking of well drilling locations.
  - Submit well permit applications (as applicable).
  - Mobilize well rehabilitation crew and equipment and begin rehabilitation (Initiation Depends on timing of USACE approval).
  - Utility Clearance.
- **Weeks 4–12:**
  - Continue well rehabilitation through the anticipated 24 wells assuming rehabilitation can begin in the initial few weeks of the project.
  - Mobilize drilling rig and crew and begin drilling and installation (timing dependent upon USACE and permit approval timing).
  - Hydraulic Testing and rehabilitated well evaluation.
- **Weeks 12 – 24:**
  - Continue Well Drilling and Installation through the anticipated 35 wells, assuming well drilling can begin by Week 5.
  - Well Development.
  - Hydraulic testing and rehabilitated/new well evaluation.
- **Weeks 24 – 30:**
  - Continue Well Development and Hydraulic testing through the 35 new and 24 rehabilitated wells.
  - Perform Data synthesis from hydraulic testing and analyze test data for specific capacity.
  - Prepare Report including well logs, rehabilitation results, hydraulic test and well evaluation results, etc.
PROPOSAL FORM

Important note to Bidders: It is essential the submitted proposal complies with all of the requirements contained in the RFQ. The undersigned Bidder agrees, if this proposal is accepted to proceed to Phase II, the Bidder shall be required to submit a competitive RFP before an award for the Project can be made.

This proposal is submitted to: Lycoming County Controller’s Office
Lycoming County Executive Plaza Building
330 Pine Street, 2nd Floor
Williamsport, PA 17701

This proposal is submitted by:

Company Name: Geo-Technology Associates, Inc.

Company Address: 3445-A Box Hill Corporate Center Drive.
Abingdon, MD 21009

Main Telephone: 410-515-9446 Main Fax: 410-515-4895

Communications and questions concerning this proposal shall be directed to:

Contact Name / Title: Paul S. Scott, P.G.

Contact Telephone: 410-515-9446 Fax: 410-515-4895

Contact Email: pscott@gtaeng.com

Receipt of Amendments (if applicable)
In submitting this proposal, Bidder represents that they have received and examined the following RFP Addendums:

Addendum No: __________________ Date: __________________
Addendum No: __________________ Date: __________________
Addendum No: __________________ Date: __________________
Addendum No: __________________ Date: __________________

Authorized Signature of Bidder
The proposal form must be signed by an individual with actual authority to bind the company.

Company Type (check one):

☐ Sole Proprietorship ☐ Partnership ☐ Corporation ☐ Joint Venture
Bidder attests that:
He/she has thoroughly reviewed the County’s RFQ and that this proposal is submitted in accordance with the RFQ requirements.

Corporations: The proposal must be signed by the President or Vice President and the signature must be attested by the Corporate Secretary or Treasurer. If any employee other than the President or Vice President signs on behalf of the corporation, or if the President's or Vice President's signature is not attested to by the Corporate Secretary or Treasurer, a copy of the corporate resolution authorizing said signature(s) must be attached to this proposal. Failure to attach a copy of the appropriate authorization, if required, may result in rejection of the proposal.

Geo-Technology Associates, Inc.  52-1404243
Company Name  Federal ID#

3445-A Box Hill Corporate Center Drive  Abingdon  Maryland  21009
Street Address  PO Box  City  State  Zip

410-515-9446  410-515-4895
Telephone #  Fax #

WITNESS:

Signature (see below)

PATRICIA L. JOHNSON
Name (print)

MARKETING DIRECTOR
Title (print)

COMPANY:

Signature (see below)

Paul S. Scott, P.G.
Name (print)

Vice President
Title (print)