

This is **EXHIBIT K**, consisting of 1 pages, referred to in and part of the **Agreement between Owner and Engineer for Professional Services** dated October 6, 2020.

**AMENDMENT TO OWNER-ENGINEER AGREEMENT**  
**Amendment No. 1**

The Effective Date of this Amendment is: August 3, 2021.

Background Data

Effective Date of Owner-Engineer Agreement:

Owner: Town of Sterling

Engineer: Capital Consultants Inc., PC, dba C2AE

Project: Water District #2

Nature of Amendment: [Check those that are applicable and delete those that are inapplicable.]

- Additional Services to be performed by Engineer
- Modifications to services of Engineer
- Modifications to responsibilities of Owner
- Modifications of payment to Engineer
- Modifications to time(s) for rendering services
- Modifications to other terms and conditions of the Agreement

Description of Modifications:

- ***The Town of Sterling would like to proceed with test well installation including hydrogeological investigations to locate potential well site, development of test well and pumping test services for potential development of additional groundwater source to supply up to 500,000 gallons per day of additional water supply capacity.***
- ***Development of additional groundwater source, including preliminary siting, testing and associated services was not included under original scope of services or fees.***
- ***Total additional Design Services – New Well Development = \$35,193.38***

Agreement Summary:

Original agreement amount:	\$ <u>700,000.00</u>
Net change for prior amendments:	\$ <u>0.00</u>
This amendment amount:	\$ <u>35,193.38</u>
Adjusted Agreement amount:	\$ <u>735,193.38</u>

Change in time for services (days or date, as applicable): \_\_\_\_\_

The foregoing Agreement Summary is for reference only and does not alter the terms of the Agreement, including those set forth in Exhibit C.

Owner and Engineer hereby agree to modify the above-referenced Agreement as set forth in this Amendment. All provisions of the Agreement not modified by this or previous Amendments remain in effect.

**OWNER:**

Town of Sterling

By: \_\_\_\_\_

Print

name: Scott Crawford

Title: Town Supervisor

Date Signed: \_\_\_\_\_

**ENGINEER:**

Capital Consultants Inc., PC, dba C2AE

By:  \_\_\_\_\_

Print

name: Ian F. Yerdon, PE

Title: Project Manager

Date Signed: August 5, 2021

# CONSULTING AGREEMENT

The undersigned hereby authorizes HydroSource Associates, PC (HSA) to conduct the work described herein, and agrees to compensate HydroSource Associates, PC for such services in accordance with the following terms and conditions.

## CLIENT INFORMATION

Name: C2AE  
Address: 301 Plainfield Road, Suite 270  
Syracuse, New York 13212  
Tanner DeWolf

Phone: 315-877-7238  
email: [tanner.dewolfe@C2AE.com](mailto:tanner.dewolfe@C2AE.com)

**DESCRIPTION OF WORK TO BE PERFORMED:** Hydrogeological, test well installation and pumping test services for the Town of Sterling, New York, as described in HSA's proposal dated 7/15/2021.

**BUDGET AND Agreement TERMS:** The total probable cost for this Agreement is \$15,750 per well, plus Frey's Costs plus 15%. This budget is a probable cost for all work described above. Invoices will be submitted periodically as work proceeds. If, as work proceeds, it is anticipated that this budget will be exceeded, HSA will notify Client's contact with a revised probable cost for Client's written approval.

HSA expects to be paid in a reasonable amount of time. Should work not be paid for in a timely fashion, HSA may cease work under this Agreement until invoices outstanding more than 30 days are paid. In the event that HSA is required to make collection efforts or take legal action on seriously overdue payments, Client shall promptly reimburse HSA for administrative costs and collection costs, including reasonable attorneys' fees and expenses. HSA shall have the right to immediately terminate this Agreement without further liability if Client fails to make timely payment or otherwise materially breaches this Agreement.

This Agreement, the attached Standard Terms and Conditions, and the documents included in Appendix A (Scope of Services, 7-15-2021, HSA's Fee Schedule and Frey's proposed costs, 8-5-21) constitute the entire agreement between HSA and Client. To the fullest extent permitted by law, and notwithstanding any other provision of this Agreement, the total liability, in the aggregate, of HSA and HSA's officers, directors, partners, employees, agents and subconsultants, and any of them, to Client and anyone claiming by, through or under Client, for any and all claims, losses, costs or damages of any nature whatsoever arising out of, resulting from or in any way related to the Project or the Agreement from any cause or causes, including but not limited to the negligence, professional errors or omissions, strict liability, breach of Agreement or warranty, express or implied, of HSA or HSA's officers, directors, employees, agents or subconsultants, or any of them, shall not exceed the total compensation received by HSA under this Agreement. Under no circumstances shall HSA's aggregate liability exceed the amount of HSA's insurance coverage. This limitation of liability applies to all injuries, damages, claims, losses, expenses and defense costs, whether based on contract, negligence, strict liability, statutory, warranty, trespass, indemnity, misrepresentation or any other theory of liability, except intentional misconduct, collectively hereinafter "Claim." HSA will not be liable for lost profits, loss of use of property, delays, or other special, indirect, incidental, consequential, punitive, exemplary or multiple damages. HSA shall not be liable for any costs, losses, damages, or other liabilities arising from any acts or omissions of the Client, its agents, staff, or other consultants or contractors employed by the Client.

**AUTHORIZED CLIENT SIGNATURE**

**HYDROSOURCE ASSOCIATES, PC**  
d/b/a HydroSource Associates Hydrogeologic Consultants, PC



7/26/2021

Signature

Date

Signature

Print Name and Title

Claude A. Cormier, President

Please return one signed original to HSA, 120 Daniel Webster Highway, Meredith, NH 03253

**STANDARD TERMS AND CONDITIONS**  
**(attached to HSA's Agreement dated 7/26/2021 with**  
**C2AE [Client])**

**1. Services.** HydroSource Associates, PC (HSA) will perform the services set forth in this Agreement, and any amendments or change orders signed by both parties. Any request or direction from the Client that would require extra work or additional time for performance or would result in an increase in HSA's costs, including unanticipated meetings, will be billed to the Client at HSA's standard rates or otherwise proposed rates in effect at the time the additional services are rendered.

**2. Standard of Care.** HSA will perform the services with the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services at the same time under similar conditions in the same or similar locality. Client will notify HSA with reasonable specificity of any deficiencies in the services within 30 days of discovery but in no event later than 120 days after substantial completion of the services, and Client will give HSA a reasonable opportunity to inspect the property and to determine whether to correct any deficiencies in services or to provide Client with an explanation as to why HSA believes there has been no deficiency in services. Client agrees that HSA's professional duties are limited to the scope of work set forth in HSA's proposal, and that Client assumes sole responsibility for determining whether the quantity and the nature of the work ordered by the Client is adequate and sufficient for the Client's intended purpose. Unless otherwise indicated in writing, HSA will be entitled to rely on documents and information Client provides and results of testing HSA or others may perform. Client agrees that HSA is allowed to rely on opinions it may form based on available documents, data and information and/or as a result of work that HSA may conduct according to regulatory standards in effect at the time the work is conducted. Client further acknowledges that natural, environmental, physical, geologic and geotechnical conditions can vary, that such conditions are subject to change, that such conditions and changes are often unforeseeable, and that the limitations of testing or available data may result in some level of risk and/or uncertainty with respect to the interpretation of these conditions, despite due professional care. HSA will not be held responsible for delays or failures to perform due to weather, labor disputes, natural disasters or other natural causes, politics or acts of God, force majeure, intervention by or inability to get approvals from public authorities, acts or omissions on Client's part or any other causes beyond HSA's reasonable control including, but not limited to potential changes in future productive capacity of wells or the quality of water they produce. Except as specifically set forth herein, HSA makes no warranties, either express or implied by HSA's proposals, oral or written communications, including emails and reports.

**3. Documents and Work Products.** All reports and other documents furnished to the Client pursuant to the Agreement and for which payment has been received shall be the property of the Client. All laboratory test data, field data, and notes, calculations, estimates, and other documents acquired or prepared by HSA during the course of the Work shall be and remain the sole property of HSA. All reports and other documents furnished by HSA as a courtesy to the Client or its agents, which have not been separately paid for (collectively, "Internal Reports"), shall be returned to HSA upon the earlier of completion of the Work or HSA's request. All Internal Reports prepared by HSA are for use solely in connection with the Work and the Client hereby agrees that such reports and documents shall not be used by the Client or any contractor or subcontractor for any other purpose whatsoever. Any unauthorized or future use or distribution of HSA's work shall be at Client's and recipient's sole risk and without liability to HSA.

**4. Opinions of Cost.** If requested, HSA will use its best efforts and experience on similar projects to provide realistic opinions or estimates of costs as appropriate based on reasonably available information. However, such opinions are intended primarily to provide information on the order of magnitude or scale of such costs and are not intended for use in firm budgeting or negotiation. Client understands actual costs of such work can depend heavily on regional economics, local construction practices, material availability, geologic and site conditions, weather, contractor skills, and many other factors beyond HSA's control.

**5. Ownership of Wells.** Client at all times owns and assumes all responsibility, including proper use, management and abandonment, of any and all test, monitoring, production or other types of wells and/or piezometers. Client agrees to indemnify HSA, its successors and assignees, and hold each of them harmless from and against any and all claims, demands, losses, damages, liabilities, costs and expenses, including reasonable legal fees, arising out of or by reason of any contamination and/or degradation of the water quality of said test/monitoring/ production wells that may result from Client's failure or negligence in adequately protecting same.

**6. Well Redevelopment/Rehabilitation.** Client assumes all risk and HSA will not be held liable for consequential damages or assume responsibility for any kind of damages to any well or appurtenances resulting from any redevelopment or rehabilitation process. HSA also does not guarantee any specific results, water quality, or production rate improvements from any well rehabilitation or redevelopment work.

**7. Right of Entry.** Client is responsible for securing any and all property rights and access to properties as may be needed for HSA to complete its work, and Client grants HSA and its subcontractors permission to enter said properties at all reasonable times and without unnecessary restriction to perform the services. If Client does not own said properties, Client represents and warrants that it has the legal right to allow HSA entry. Client further acknowledges that Client assumes full responsibility for ensuring there are no encumbrances on said properties that would prevent development of the properties for the intended use.

**8. Location Information.** HSA's services do not include costs associated with professional land surveying or accurate horizontal and vertical locations of features, surveys, tests, drilling or sampling locations. Client acknowledges that HSA's efforts do not include any work associated with wetlands, wetland delineation or wetland boundary identification relative to any well sites, or wetlands permitting that may be necessary in relation to the groundwater source location and development efforts. Field test sites, survey, test boring and well locations, boundaries, cultural features and other features described in HSA documents, reports or shown on maps or sketches are based on information furnished by others or estimates made in the field by HSA personnel. Such dimensions, locations, depths, or elevations should be considered as approximations. Unless specifically stated otherwise, the services and unit fees included in this proposal do not include professional land surveying of the site or accurate horizontal and vertical locations of features, tests, or sampling locations.

**9. Termination and Work Stoppage.** This Agreement may be terminated by either party for any reason upon 10 days written notice. If Client requests, orders, or otherwise causes HSA to suspend, delay, or terminate its services, in whole or in part, Client agrees that HSA shall be paid for work performed on the Agreement up to the date of termination or suspension.

**10. Site Restoration.** HSA will use due care so as not to unreasonably cause impact to the site during its work. Although HSA will act to limit impacts to landscaping, paving, systems and structures at the site, Client acknowledges that due to the nature of the work, some impacts may occur even with the exercise of due care, and Client agrees to compensate HSA for any restoration it is asked to perform unless otherwise indicated in the Agreement.

**11. Underground Facilities.** Client is responsible for contacting local governmental authorities and private firms who coordinate underground utility information (e.g. DigSafe, DigSafely, PUPS, etc.). HSA will review plans and information they or Client provides. Client agrees that HSA is allowed to rely on such information and Client will not hold HSA liable for any damage to underground services or structures not accurately identified in such plans or information provided to HSA by such sources. Client agrees to indemnify and hold HSA, its directors, officers, employees, agents and subcontractors harmless from any such claims, suits or losses, including related reasonable attorney's fees, arising out of such damage and its repair, except to the extent caused by HSA's negligence.

**12. Lab Tests and Samples.** HSA is entitled to rely on the results of laboratory tests using generally accepted methodologies, and will not be held responsible for any costs or liability associated with or resulting from independent laboratory errors. HSA, at its sole discretion, may retain or dispose of soil, water or other samples after submitting samples for independent testing and/or completing its own analyses. Other than samples collected during the course of HSA's work for analytical purposes, Client maintains ownership and responsibility for any water, soil or other materials generated during the completion of HSA's services including that which may be discharged during the drilling, installation or pumping of wells.

**13. Potential Source of Contaminants.** Client acknowledges that any efforts HSA may propose or provide to identify potential sources of contamination may not be comprehensive, and do not represent any type of warranty or guarantee that a particular well site or water source will not be subject to potential future contamination. Unknown, Undisclosed and Changed Conditions.

**14. Unknown, Undisclosed and Changed Conditions.** The parties acknowledge that HSA's scope of services does not include any services related to a Hazardous Environmental Condition (the presence of asbestos, PCBs, petroleum, radioactive materials, or any type of hazardous substances or waste). If HSA or any other party encounters a Hazardous Environmental Condition, HSA may, at its option and without liability for consequential or any other damages, suspend

performance of services affected thereby until Client: (i) retains appropriate specialist consultants or contractors to identify and, as appropriate, abate, remediate, or remove the Hazardous Environmental Condition; and (ii) warrants that the work site in question is in full compliance with applicable Laws and Regulations.

Client agrees to promptly advise HSA of any hazardous substance or any condition, known or that reasonably should be known by Client, existing in, on, or near the site that presents a potential danger to human health, the environment, or HSA's or its subcontractors' equipment. By virtue of entering into this Agreement or providing services hereunder, HSA does not assume control of or responsibility as an operator or otherwise for the site or the person(s) in charge of the site, or undertake responsibility for reporting to any federal, state or local public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. Client agrees under advice of its counsel to notify the appropriate federal, state or local public agencies as required by law; or otherwise to disclose, in a timely manner, any information that may be necessary to prevent damage to human health, safety, or the environment. In addition, Client waives any claims against HSA arising from HSA's discovery of unanticipated hazardous conditions or suspected hazardous materials.

In connection with toxic or hazardous substances or constituents and to the maximum extent permitted by law, client agrees to defend, hold harmless and indemnify HSA from and against any and all claims, liabilities, or judgments, except to the extent finally determined as being caused by HSA's negligence or willful misconduct, resulting from:

- (a) Client's violation of any federal, state, or local statute, regulation or ordinance relating to the management or disposal of toxic or hazardous substances or constituents;
- (b) Client's undertaking of or arrangement for the handling, removal, treatment, storage, transportation or disposal of toxic or hazardous substances or constituents found or identified at the site;
- (c) Any third party suit or claim for damages against HSA alleging strict liability, personal injury (including death), or property damage from exposure to or release of toxic or hazardous substances or constituents at or from the project site before, during, or after completion of HSA's services under this Agreement.

The discovery of any hazardous waste, substances, pollutants, contaminants, underground obstructions, artesian pressure, conditions or utilities on or in the job site(s) which were not brought to the attention of HSA prior to the date of the services performed will constitute a materially different site condition entitling HSA, at its option, to alter or terminate this Agreement (and to receive payment for all work performed up to and including the date of such termination) or to receive an equitable adjustment in the Agreement price and time for performance. HSA, however, shall only have the right to terminate if such different site condition(s) creates additional health and safety risks or requires HSA to perform work outside the original scope or beyond its capabilities. In any event, HSA may terminate operations on a site which it believes presents an unreasonable health, environmental or safety risk.

In the event that undisclosed contaminants are encountered, HSA and/or its subcontractors will make a reasonable effort to clean its laboratory and field equipment which may become contaminated in the conduct of services. In the event such equipment cannot be completely decontaminated because of the type of hazards encountered, it may be necessary to properly dispose of the equipment in a manner that conforms to State and/or federal laws. Client agrees to pay the fair market value of any such equipment and reasonable disposal costs.

If changed or unanticipated conditions or delays make additional services necessary or result in additional costs or time for performance, HSA will promptly notify Client and, if mutually agreeable, the parties will negotiate appropriate changes to the scope of services, compensation and schedule. If the parties are unable to reach agreement, HSA will be entitled to immediately terminate its services and to be equitably compensated for services already performed. In the event of emergency, HSA may take immediate steps to protect public health, safety and the environment, and will be equitably compensated by Client therefor.

**15. Limits on HSA's Responsibility.** HSA shall not be liable for any bodily injury, death, or injury to or destruction of tangible property except as the same may have been caused by the negligence of HSA. HSA will not be responsible for the acts or omissions of Client or any other contractors, agents, employees or others at the site, except for its own subcontractors and employees. HSA will not supervise, direct or have control over or the authority to stop any contractor's work, nor shall HSA's activities nor the presence of HSA or its employees and subcontractors be construed to imply that HSA has authority over or responsibility for any activities or failure of Client or any other contractor to comply with contracts, plans, specifications or laws. HSA neither guarantees the performance of any contractor nor assumes responsibility for any contractor's failure to furnish and perform its work nor the quality thereof.

**16. Confidentiality; Subpoenas.** Information about this Agreement and HSA's services, and information Client provides to HSA regarding Client's business and the site, will be maintained in confidence and will not be disclosed to others without Client's consent, except as HSA reasonably believes is necessary (a) to perform its services, (b) to comply with professional standards to protect public health, safety and the environment, and (c) to comply with laws and court orders. HSA will make reasonable efforts to give Client prior notice of any disclosure under (b) or (c) above. Information available to the public and information acquired from third parties without a breach of duty will not be considered confidential. Should HSA be compelled by law to provide testimony or other evidence by any party, whether at deposition, hearing, trial, governmental inquiry or audit, in relation to services provided under this Agreement, then Client agrees to compensate HSA for the associated reasonable expenses and labor for HSA's preparations and testimony at appropriate unit rates.

**17. Insurance.** HSA currently maintains workers compensation, commercial general liability, automobile liability, and professional liability, insurance in the following minimum amounts:

- (a) Workers Compensation – each accident: \$100,000; disease, ea. employee: \$100,000; disease, policy limit: \$500,000
- (b) General Liability – \$1,000,000 per occurrence and \$2,000,000 aggregate
- (c) Automobile Liability – \$1,000,000 Bodily Injury & Property Damage; \$5,000 Medical Payments
- (d) Professional Liability – \$1,000,000 per occurrence and aggregate

HSA will furnish Client with certificates of such insurance on request. To the extent damages are covered by insurance, Client waives all rights of subrogation against HSA and its subcontractors, consultants, agents and employees for damages, except such rights as Client may have to the proceeds of such insurance. At the Client's request, HSA will purchase specific additional insurance provided it is commercially available and the Client pays the premium.

**18. Limitation of Liability.** To the fullest extent permitted by law and notwithstanding anything else in this Agreement to the contrary, the aggregate liability of HSA and its affiliates and subcontractors and their employees, officers, directors and agents (collectively referred to in this paragraph as "HSA") for all claims arising out of this Agreement or the services HSA provides is limited to the compensation received by HSA under this Agreement. Under no circumstances shall HSA's aggregate liability exceed the amount of HSA's insurance coverage. This limitation of liability applies to all injuries, damages, claims, losses, expenses, attorney's fees, mediation, arbitration and court costs, whether based on contract, negligence, strict liability, statutory, warranty, trespass, indemnity, misrepresentation or any other theory of liability, except intentional misconduct. Client hereby acknowledges its acceptance of all past work HSA may have performed on Client's behalf and waives its rights to any and all claims that are in any way associated with services HSA has performed under any prior agreement. All claims, including claims for negligence or any other cause whatsoever, shall be deemed waived unless made in writing and received by HSA within one (1) year after HSA's substantial completion of work hereunder. HSA will not be liable for lost revenue or profits, loss of use of property, delays, or other special, indirect, incidental, consequential, punitive, exemplary or multiple damages. HSA shall not be liable for any costs, losses, damages, or other liabilities arising from any acts or omissions of the Client, its agents, staff, or other consultants or contractors employed by the Client.

**19. Indemnification.** Client agrees to hold harmless, indemnify, and defend HSA and its affiliates and subcontractors and their employees, and officers against all claims, suits, and fines, including mandated cleanup costs and attorneys' fees and other costs of settlement and defense, which arise out of or are related to this Agreement or the services, except to the extent such claims, suits, or fines are a result of HSA's negligence or willful misconduct.

**20. Statute of Limitations.** All causes of action, including but not limited to actions for indemnification, arising out of HSA's work shall be deemed to have accrued and the applicable statutes of limitation shall commence to run no later than the date of substantial completion of HSA's work or the date of HSA's final invoice for work undertaken specifically under this Agreement.

**21. Special, Incidental, Indirect, Consequential or Liquidated Damages.** To the fullest extent permitted by law, Client, on behalf of itself and its agents, employees, officers, and citizens, waives any and all claims for or entitlement to special, incidental, indirect, or consequential damages arising out of, resulting from, or in any way related to work performed by HSA under this Agreement it or they may have against HSA and HSA's employees, officers, directors,

agents, insurers, partners, and consultants. Client waives any right to any liquidated damages and no deduction shall be made from any invoice on account of liquidated damages.

**22. Miscellaneous.** The terms and conditions of this Agreement shall survive the completion of the services under this Agreement and the termination of the Agreement for any cause. Any amendment to this Agreement must be in writing signed by both parties. This Agreement and its Terms and Conditions supersede any other terms or conditions from any other document. Headings in these Terms and Conditions are for convenience only and do not form a part of the Agreement. Nothing in this Agreement shall be construed to give any rights or benefits to third parties, and in no event shall HSA, its individual professionals, employees, agents, and subcontractors have any duty or obligation to any third party. The invalidity or unenforceability of any of the provisions of this Agreement shall not affect the validity or enforceability of any other provisions of this Agreement. If any part or whole of any provision of this Agreement is found by an arbitrator or Court or such other competent authority to be void or unenforceable, that part or whole of the provision shall be deemed as deleted from this Agreement. Notwithstanding, the competent remainder thereof (if any) plus the remaining provisions of this Agreement shall continue to be in full force and effect.



# **APPENDIX A**

## **SCOPE OF SERVICES**

### **HSA's Fee Schedule**

#### **Frey Well Drilling's Proposed Costs**

**August 5, 2021**



# HydroSource Associates, PC

120 Daniel Webster Highway, Meredith, NH 03253

Phone: (603) 279-0301

[www.teamhydrosorce.com](http://www.teamhydrosorce.com)

July 15, 2021

Tanner DeWolf  
C2AE  
301 Plainfield Road, Ste. 270  
Syracuse, New York 13212

**Re: Town of Sterling, New York – Hydrogeologic and Test Well Installation Services Proposal**

Dear Mr. De Wolf:

Attached is a proposal for hydrogeological, test well installation and pumping test services for the Town of Sterling, New York (Town), pursuant to your request. We understand the Town is seeking to evaluate this site as a candidate for development of an additional groundwater source that could provide up to 500,000 gallons per day (350 gallons per minute) of water supply capacity.

We have requested costs from Frey Well Drilling, Inc. Company for test well installation and step pumping test services according to the specifications you listed in your correspondence and will forward those to you when they arrive.

Please let me know if you need anything else, or if you have any questions regarding what we have proposed.

Sincerely,

A handwritten signature in black ink, reading 'Claude A. Cormier', written in a cursive style.

Claude A. Cormier  
President

CAC:cwr

**TOWN OF STERLING, NEW YORK  
PROPOSED SCOPE OF HYDROGEOLOGIC AND TEST WELL SERVICES**

**July 15, 2021**

**Test Well Installation & Preliminary Yield Testing**

HSA proposes to install a six-inch diameter test well at a site approved by the Town of Sterling, New York (Town) on its wellfield property off Route 104A. Assuming site conditions and observations made during well installation warrant, we will conduct a step pumping test on the test well to assess the production capacity that could be expected were a properly designed, larger diameter well to be constructed at the site.

A log of the subsurface hydrogeologic conditions will be generated, and geologic samples will undergo sieve analyses. The results would be used to design specifications for a large-diameter well to be used for production purposes. The test well may also serve as a useful monitoring well later during future testing of the large diameter well that is required under current NYSDOH and NYSDEC permitting regulations.

Test Well Installation - HSA would prepare drilling quotation specifications, solicit quotations, select appropriate drilling services, and contract a qualified, New York State-licensed well drilling services firm. HSA has worked with many well drillers in New York State and elsewhere. We have experience with the various drill technologies that are available for drilling water wells, and experience in dealing with challenges that may be expected during drilling given the local hydrogeologic setting and type of aquifer targeted for development. HSA works with qualified drill contractors and makes recommendations as to equipment that is appropriate for the conditions expected at test well locations.



**Installation of an HSA-sited test well**

During test well drilling, an HSA hydrogeologist will be on site to log the well and consult with the driller as necessary. HSA will collect overburden samples as drilling proceeds, record information needed to evaluate the well and site conditions, and document the various hydrogeologic information required by the New York State regulatory agencies for future

approvals. We will record the variation of geology with depth, noting the depth and nature of water-bearing zones, and measure aquifer/well water production rates.

In depth intervals where sufficiently productive (water-bearing) sediments are encountered, a pre-designed well screen will be installed. The screened interval will be developed by surging and purging the well with blasts of compressed air, the purpose being to remove fine-grained material from the aquifer region immediately surrounding the screen so that water can move more efficiently from the aquifer through the screen and into the well. Developing the well before it is tested helps insure that pumping test results accurately reflect the productivity of the aquifer.

For each test well, we assume six-inch diameter drilling; steel well casing; installation of up to a 10-foot section of temporary, stock test well screen and retraction of the casing to expose the screen to the aquifer; up to 50 feet total well depth; and four to six hours of airlift well development. The well will be outfitted with a locking well cap and padlock, with a set of keys provided to the Town.

Logs of the existing wells at the wellfield show that the subsurface sediments include coarse sand and gravel with cobbles and/or boulders. Given these conditions, we propose using the dual-rotary drilling method to install wells. This is the preferred method mainly due to the quality of the formation samples produced while drilling in comparison to other drilling methods. Such samples are critical to properly assess and design a successful production well. The dual-rotary method also is typically able to penetrate such conditions without requiring the introduction of drilling mud into the aquifer, and therefore eliminates the various problems, such as increased well development costs and reduced aquifer and well yields, drilling mud can cause.

Unlike cable-tool or conventional open-hole, air/mud rotary methods used to install most domestic wells, the dual rotary method permits depth-specific accuracy of sediment sampling and water volume. Dual rotary well drilling rigs have two independent drives. One of the drives is identical to the tophead drive seen on a conventional water well drill rig. That primary drive advances an air-actuated percussion hammer and bit suspended from a length of drill pipe (generally in 20-foot lengths). The secondary drive uses a set of jaws to clamp on to a length of casing pipe. A ring bit studded with carbide buttons is welded to the bottom of the casing. The secondary drive rotates or spins the casing as it exerts downward pressure on it, driving (advancing) the casing into the ground. The primary drive advances the drill string and percussion hammer, which are telescoped inside the casing being driven by the secondary drive. The primary and secondary drives move vertically on the mast independently of each other, which means that the driller has independent control of the depth of the percussion bit and the bottom of the casing. Water and sediment samples are ejected at the surface through a cyclone attached to the side of the drill rig.

With this method, the depth from which a sediment sample is derived is often known more accurately because there is less risk that a sample produced when drilling at a particular depth has been adulterated with sediment originating from a shallower depth, because shallower depths have been cased off. With this method, one can better identify and evaluate the intervals that have the greatest yield potential, and thus design and construct a better, more productive well.

Because the casing is advanced as the borehole is drilled, there is also no need to circulate a mud slurry to keep the borehole walls from collapsing during drilling. Mud slurries plug the open pore space within an aquifer, impeding groundwater flow through the sediments, and often severely reduce aquifer productivity. In addition, geologic (soil) samples collected from wells drilled using the mud rotary method normally do not provide sufficient information for properly evaluating aquifer properties needed to make accurate decisions regarding proper well design.



**HSA-sited and developed well exhibiting >450 gpm of natural artesian flow that has now continued unabated for over 15 years.**

Similarly, when using the dual rotary method, the volume of water ejected from the cyclone at any depth should be representative of the productivity of the aquifer at that particular depth, since shallower productive zones are blocked by the casing. Such depth-discrete water production evaluations are not possible with other drilling methods, yet they are valuable in evaluating the yield potential of a site, and in determining how to best design a production well that maximizes the yield based on that site's particular stratigraphy.

Another important advantage is that the dual-rotary method offers greater ability in dealing with drilling problems encountered in environments where completion of a well can be challenging. This could be important in the coarse-grained glacial sediments of the Sterling area, as the local gravel deposits have been reported to include a good proportion of cobbles and boulders. These types of sediments usually cannot be successfully penetrated with conventional small-diameter, drive-and-wash/split-spoon sampling type methods,

and reports of early “refusal” when encountering a boulder (when the aquifer lies beneath), and abandonment of what could be a highly productive site are not uncommon. Use of the dual-rotary method can prevent this from happening.

Step Pumping Test – A temporary submersible pump will be installed in the well, and a 4– to 6-hour step pumping test will be conducted, followed immediately by monitoring of an equivalent period of aquifer recovery to confirm that the aquifer recharges at a sufficient rate to further assure that the extraction rate sought is sustainable. The purpose of the test will be to gather the information needed to estimate the yield that might be available were a custom-designed, larger-diameter well to be constructed at that particular site.

## **Analyses, Progress Report & Recommendations for Proceeding with New Source Development**

Samples of sediments from depth intervals in the test well that are considered candidates for screening in a large-diameter well will undergo sieve analyses, and a hydrogeologic log of the test well will be prepared. The drilling contractor will complete sieve analyses of the samples and develop their own well screen and gravel pack recommendations. HSA will complete independent sieve analyses and well screen and gravel pack design aimed at optimizing the yield and efficiency of the well based on the aquifer characteristics at the test well site.



**HSA Project Manager Supervises Pumping Test of 1,100 gpm Well**

The results of the step test will be summarized and presented graphically. We will provide our opinion as to the potential yield that may be available from a large-diameter well.

A brief report will be prepared summarizing the results of test well drilling and the step pumping test. It will contain recommendations for proceeding with proposed large diameter well installation and design. It will also include the test well log and proposed preliminary large-diameter well design and construction specifications.

### **PROBABLE COSTS**

Test Well Installation & Preliminary Yield Testing (one well)	\$9,000 to \$11,000
Analyses, Progress Report & Recommendations	\$ 4,750
Subcontracted Services for Well Installation and Testing	Direct Cost + 15%

HSA's Probable Costs include anticipated HSA labor and expenses to complete the work described and drilling subcontractors' costs for listed well drilling and testing activities. The budget does not include any costs associated with well abandonment, land access acquisition or additional on-site meetings as may be requested by regulators, the Town, C2AE or others. Any additional efforts that are authorized or requested would be charged at additional time-and-expense. Costs are subject to change based upon costs and/or quotations received at the time the

work is conducted and/or if unexpected conditions and/or unforeseeable regulatory requirements are encountered. Note also that the Test Well Installation & Testing cost will be contingent on geologic and site conditions, the actual well depth, and screening parameters actually required.

We understand that the project is being funded by Rural Development. As such, the costs for the subcontracted well drilling and testing services include use of certified American Iron and Steel (AIS) components, and prevailing wage rates, as applicable.

We assume the Town will be responsible for providing an appropriate accessway to the well site for well drilling and testing equipment, and will make all arrangements and/or provisions necessary for HSA and its representatives and subcontractors to enter upon the property as required to perform the services. We also assume that the Town will provide a reasonable amount of excavation services at the test well site (i.e., digging of a shallow settling pit and/or drainage ditches to direct drilling and pumping test effluent).

Note that although we often succeed in reaching a client's yield target with the first test well drilled, experience has shown that, in project planning, it is wise to budget for the drilling of multiple wells, especially when the goal is to develop a substantial daily production rate.

Finally, if it has not yet already, we recommend that the Town correspond with the NYSDOH and NYSDEC to review the proposed well location with them and obtain their comments regarding suitability of the site for development of a possible future public drinking water supply.

# FEE SCHEDULE

Through 2021

## LABOR

## COST PER HOUR

Principal	\$175.00
Senior Scientist / Project Manager	\$150.00
Staff Scientist	\$125.00
Field Technician	\$110.00
Administrative Staff	\$ 95.00

## EXPENSES

Mileage	\$0.695 per mile
Other	Direct cost plus 15%

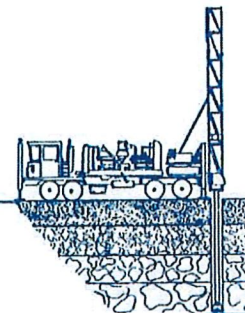
All work associated with depositions, testimony and/or legal proceedings will be charged at 1.5X the rates listed above.





Phone 716-937-7977  
FAX 716-937-9390

# Frey Well Drilling, Inc.



GAS WELLS • WATER WELLS • ROCK DRILLING 4" to 36"

11565 BROADWAY  
ALDEN, NEW YORK 14004

August 5, 2021

TO: Claude Cormier  
Hydrosource

603-279-0301  
[ccormier@teamhydrosource.com](mailto:ccormier@teamhydrosource.com)

FROM: Bill Frey  
FREY WELL DRILLING INC.,

Re: Price quotation for:  
Sterling, NY test well

We respectfully submit the following price quotation for the above project for your review.

- 1.) Mobilization & de-mobilization @..... \$ 5,000.00  
Of Dual Rotary Drill Rig, all casings, well screens,  
Support equipment.  
Note: one mobilization – will set screen on this mob.
- 2.) Drill with casing and collect samples  
Estimate 50 f t; @ \$60.00/ft.....\$ 3,000.00
- 3.) Send samples for analysis @.....\$ 400.00
- 4.) Set 10' screen & pull back 6" casing @..... \$ 2,000.00
- 5.) Develop well with surge block & air  
Estimated 5 hrs. @ \$450.00/hr. @..... \$ 2,250.00
- 6.) Install pump & run 4-6 hour draw down test @..... \$ 2,800.00  
Includes stilling tube, generator, meter & complete  
Pump system with 200 ' discharge

If you have any questions, or wish to discuss this further, please do not hesitate to call.

We appreciate your consideration and look forward to serve your drilling needs.