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

Request for Quotation

RFQ NUMBER	PAGE
DNRB12071	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
FRANK WHITTAKER
304-558-2316

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO
DIVISION OF NATURAL RESOURCES
CANAAN VALLEY RESORT
ATTN: PARK SUPERINTENDENT
ROUTE 1, BOX 320
DAVIS, WV
26260 866-4111

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
01/19/2012				

BID OPENING DATE: 02/16/2012 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT

********** ADDENDUM NO. 2 **********

THIS ADDDENDUM IS ISSUED TO:

1) PROVIDE A COPY OF THE NON-MANDATORY PRE-BID SIGN IN SHEET.

2) EXTEND THE DEADLINE FOR TECHNICAL QUESTIONS TO: 02/02/2012 AT 4:00 PM.

3) TO EXTEND THE BID OPENING DATE AND TIME TO: 02/16/2012 AT 1:30 PM

4) ADD THE FOLLOWING REQUIREMENT FOR GENERAL LIABILITY INSURANCE.

(XX) INSURANCE: SUCCESSFUL VENDOR SHALL FURNISH PROOF OF COMMERCIAL GENERAL LIABILITY INSURANCE PRIOR TO ISSUANCE OF CONTRACT. UNLESS OTHERWISE SPECIFIED IN THE BID DOCUMENTS, THE MINIMUM AMOUNT OF INSURANCE COVERAGE REQUIRED IS $250,000.

5) PROVIDE THE ATTACHED PRE-BID MEETING MINUTES.

6) PROVIDE THE ATTACHED REVISED PROCEEDURE DOCUMENTS.

7) PRIVIDE THE ATTACHED REVISED PRICING PAGE.

********** END ADDENDUM NO. 2 **********

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE

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

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.

2. The State may accept or reject in part, or in whole, any bid.

3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required $125 fee.

4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.

5. Payment may only be made after the delivery and acceptance of goods or services.

6. Interest may be paid for late payment in accordance with the ***West Virginia Code***.

7. Vendor preference will be granted upon written request in accordance with the ***West Virginia Code***.

8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.

10. The laws of the State of West Virginia and the ***Legislative Rules*** of the Purchasing Division shall govern the purchasing process.

11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.

12. BANKRUPTCY: In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.

13. HIPAA BUSINESS ASSOCIATE ADDENDUM: The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at **www.state.wv.us/admin/purchase/vrc/hipaa.html** and is hereby made part of the agreement provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.

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

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

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

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

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.

2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.

3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.

4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130

5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).

PRE-BID CONFERENCE

SIGN IN SHEET

Request for Quotation Number DNRB12071 Well Rehab Date 12/29/2011 Park Canaan Valley Resort

PLEASE PRINT LEGIBLY. THIS INFORMATION IS ESSENTIAL TO CONTACT THE ATTENDESS IN A TIMELY MANNER. FAILURE TO DO SO MAY RESULT IN DELAYS IN YOUR COMPANY GETTING IMPORTANT BID INFORMATION.

Firm Name:	FRAME Drilling Co., Inc	Firm Name:	Wayne's Water N' Well
Firm Address:	P.O. Box 1907 Elkins, W.Va. 26241	Firm Address:	19139 Garrett Hwy Oakland Md 21550
Representative Attending:	Jack R. Frame II	Representative Attending:	Wayne Bolden
Phone Number:	304-636-6025	Phone Number:	301-387-7181
Fax Number:	304-636-0231	Fax Number:	
Email Address:	Frame drilling @ frontier.com	Email Address:	
Firm Name:	Negley's Well Drilling	Firm Name:	
Firm Address:	16199 Cumberland Highway Newburg PA 17240	Firm Address:	
Representative Attending:	Bob Davidson	Representative Attending:	
Phone Number:	717-532-9190	Phone Number:	
Fax Number:	717-532-2073	Fax Number:	
Email Address:	bdavidson@negleys.net	Email Address:	
Firm Name:	Ground Water Science	Firm Name:	
Firm Address:	22 Edgewater Dr. Poland OH 44514	Firm Address:	
Representative Attending:	Stuart Smith	Representative Attending:	
Phone Number:	330.787.0496	Phone Number:	
Fax Number:	419.358.0328	Fax Number:	
Email Address:	stuart@groundwaterscience.com	Email Address:	

DNRB12074 Well Driller Services
Canaan Valley Resort

RFQ Addendum #2

1. A copy of the Pre-Bid Meeting Sign-In Sheet is attached.

2. The deadline for submitting technical questions shall be changed to January 25, 2012, 4:00 pm. Response to technical questions will issued not later than February 3, 2012. The Bid Opening shall be changed to February 17, 2012.

3. The successful vendor shall furnish proof of commercial general liability insurance prior to issuance of a contract. The minimum amount of insurance coverage required is $250,000.00.

4. Pre-Bid Meeting Minutes - A Pre-Bid Meeting was held for the above noted project on Dec 29, 2011, at 1:00 at Canaan Valley Lodge. After the meeting a site inspection for field observations was conducted. The lettered items listed below are a synopsis of the meeting discussion and field observations.

a. James Schotsch, WVDNR discussed administrative items related to the project RFQ documents and as noted on the Pre-Bid Meeting Checklist. Significant discussion items include:
   - RFQ documents may be obtained from the Division of Purchasing.
   - Plans and Specifications may be obtained from Parks and Recreation, Engineering Group.
   - Technical questions must be submitted to the Division of Purchasing.
   - Bid packages must be submitted to the Division of Purchasing.
   - Pre-Bid meeting is a non-mandatory meeting.
   - Bid Bonds will not be required.

b. Stuart Smith of Ground Water Sciences discussed the scope of the project and other technical details.
   - Review of well logs: The available well logs are included with this addendum.
   - Well location: The two production wells are located on a project map. Based on discussion and field observation it was determined that the location of Well No.1 on the map is incorrect. The correct location of Well No. 1 is approximately 150 feet SE of the Water Plant Building. The location is accessible.
   - The Existing Pitless units: Based on discussion and field observation the existing pitless units must be modified or replaced as noted in the attached Revised Specifications.
   - Discussion of Well Liner: Based on discussion and subsequent investigation and review the existing well liners are to be removed and not re-installed. Please refer to the attached Revised Specifications.
   - Discussion of existing/abandoned wells: Based on discussion and field observation there are two abandoned well on the site that have not been properly plugged. The scope of work has been revised to include a task item for plugging both wells. The locations are known, nearby and accessible.
   - Stuart noted that he or Allen will perform the pumping tests. A pay item for providing test pumps has been included in the Revised Bid Documents.

c. Other Discussion Items
   - Well Permits, as necessary, will be provided after a contract is executed.
   - Disposal of well cleaning fluids is discussed the Revised Bid Documents.
   - Well cleaning fluids that are hauled offsite may be discharged to a sanitary manhole near the golf clubhouse.

General Instructions: Well Cleaning and Disinfection, Canaan Valley State Park Wells – As Amended 1/9/2012

Background:

Two wells are targeted for rehabilitation cleaning: Wells 1 and 2. Both are public water supply wells. Available well logs are attached. Two abandoned wells are targeted for abandonment sealing. One is a 1960s-era water well. The second is an abandoned borehole with tools reportedly stuck in the hole. We have no records on these two at the present time.

Well	Date completed	Total depth (ft)	Casing (ft)	Static WL	Dia (in)
1	1999	250	63	19	6
2	1999	250	63	11	6

Wells slated for rehabilitation: Casing is galvanized steel (Schedule 40). Available performance information are summarized as follows:

Well 1	Nov 10,1999	June 24, 2011
Static Water Level (ft.)	19	19.45
Pumping Water Level (ft.)	72	59.54
Drawdown (ft.)	53	40.09
Pumping Rate (g.p.m.)	23	24
Specific Capacity (gpm/f)	0.4339	0.59865

Well 2	Dec 10,1999	June 24, 2011
Static Water Level (ft.)	11	6.60
Pumping Water Level (ft.)	187	43.40
Drawdown (ft.)	176	36.80
Pumping Rate (g.p.m.)	60	74
Specific Capacity	0.34	2.01

The accuracy of the 1999 information cannot be verified. The 2011 values for Well 2 suggest that the reported flow rate, pumping water level and drawdown for Well 2 in 1999 may be in error. Well 1 is equipped with a Baker Monitor spool-type pitless unit. Well 2 is equipped with a through-the-casing pitless adapter.

Formations are combinations of shale, sandstone, and limestone (Greenbrier Group), with water being produced in fracture zones. Water quality is low in total dissolved solids, hardness, alkalinity, iron and manganese. Clogging has not been evaluated and is probably not severe, but an accumulation from 12 years of activity is expected.

Treatment and Testing:

In general, well rehabilitation will involve the following tasks 1) remove in-place well pumps (both wells); 2) remove full-length 4-inch slotted F-480 PVC liners (both wells), 2) inspect, clean, and repair pump and discharge pipe components as required; 3) brushing and surging to remove surficial material; 4) application of a well cleaning treatment program (details following); 5) chlorine disinfection; 6) post-cleaning video inspection; 7) assisting with post-cleaning pumping tests, **8) repairs and upgrades to pitless units and adapters, and 9)** reinstallation of permanent pumps. The facility engineer's hydrogeologic consultants (Ground Water Science) have provided a list of necessary equipment for this well rehabilitation project (listed at the end of this technical task description).

Specific Rehabilitation Work Tasks for both Well 1 and Well 2

Note to potential bidders: There are **two** alternative methods **for redevelopment** permitted **but for the purpose of bidding (unit basis) they can be considered the same procedure for bidding time and materials**. See list of necessary equipment attached. *All tasks and volumes should be repeated for each well.*

(A) <u>Preparation, pump and discharge pipe, liner removal, and initial video inspection</u>:

(1) Pull discharge pipe, wire, and pump (set at 200 ft) and lay out on clean plastic sheet or plastic tarp, or on stands off the ground. Inspect for problems including wire grounding and bring problems to the attention of the water superintendent. Clean off visible fouling on inside and outside surfaces (air pressure and/or pressure washer – water only) and cap pipe joint ends.

(2) In well 1 (spool-type pitless unit) plug off the discharge line and close the well's valve into the water plant during cleaning. The pitless unit will be repaired (see below). In well 2 (a through-the-casing pitless adapter), dig to the discharge line, remove the pitless adapter completely, plug the discharge line, and plan to replace the pitless adapter (see below).

(3) Remove the installed 4-inch PVC liner. The liners reportedly extend from 5 feet below the well top to the total depth in each well. The liner will not be reinstalled **under this work package**. Removal method is at the contractor's discretion but the liner must be completely removed.

(4) After clearing well, conduct a pre-cleaning downhole video of the well. If necessary, employ water column-clearing methods first. The video system shall be in color and provide in-progress switching between down and side view during the inspection. The video system shall provide an image of sufficient quality to permit the facility engineer's hydrogeologic consultants to evaluate borehole condition. A record of the video shall be made on DVD and a copy provided to the facility engineer's hydrogeologic consultants.

(B) <u>Well rehabilitation and disinfection</u>: The following program is planned:

(1) <u>Brushing</u>: Brush the casing and open borehole to remove surface encrustations and biofouling. The recommended tool is a Cotey Chemical well brush, or equivalent cylindrical brush with fiberglass or plastic bristles set to abrade the nominal casing I.D., mounted on a drill-

stem sub. Aggressive wire brushes will not be allowed. Added weight may be necessary. The hoist system used must be capable of inserting and removing the brush assembly safely.

One pass in and out is anticipated. Run the brush. Install 1-inch+ airline and airlift until clear.

(2) Chemical dosage

(a) Install a 1-in. or greater plastic tremie line (threaded rigid PVC-CPVC, flexible PE), or alternative such as frac pipe. About 240 ft of tremie should be sufficient. This may be the same as the development airline.

(b) An NSF 60-listed well cleaning chemical product that is primarily glacial (above 95 %) glycolic acid plus suspending and dispersing polymers, is specified due to the probable presence of biofilm but relative lack of mineral-heavy deposits, iron or manganese. One such product is Baroid IDP Aqua-Clear AE, supplied in 5-gal carboys as a concentrated product. Alternatives must be presented to the facility engineer's Hydrogeologist Consultant for approval. There shall be NO phosphorus of any kind (including phosphoric acid and in polymer additives) in any chemicals used. Documentation of any alternative chemical must positively rule out the presence of phosphorus in any form. The chemical may be dosed directly into the well.

(c) Volumes: The specified dosage for Aqua Clear AE or equivalent for each well is 30 gal. of product.

Safety: The liquid chemical is nearly 100 percent glycolic acid. MSDS must be on site. The acid mixture is best transferred to the well using an acid-resistant transfer pump safe for the acids used and black PE hose, with secure, nonleaking hose connections. People handling the acid must have face and other splash protection, and avoid breathing fumes of concentrated chemical, or direct skin contact. Clean wash water must be available at hand in case of spills or splash.

Handling: Follow all manufacturer handling and safety instructions. The concentrated liquid chemical may begin to solidify below 50 degrees F, and so plan accordingly as needed. Diluted organic acids will not freeze until below 32 F.

(d) Although wells 1 and 2 are some distance apart, prior to dosing chemical, assure that the available storage is full and both wells are locked out and tagged during the chemical application and soak period (Steps 2.e and 3.c.i). The other well can be restarted as chemical is being pumped off (step 3.c.ii). It can be restarted before with regular check of pH and appearance.

(e) Application:
i) Following safe practices, transfer specified chemical volume into the well.
ii) Surge chemical in the well for at least one hour. Leave to soak 12 hr.

(3) Mixing and redevelopment

Two alternatives for well redevelopment are specified. See "necessary equipment" list. Necessary equipment, either method:

1) Controlled, water-tight connection between tools downhole and discharge to outflow chamber.

2) Provide an outflow chamber (large baffled mud tank or equivalent) for neutralizing chemical and settling developed solids before discharge.
3) Provide a means to measure flow rate while airlift pumping **such as a** horizontal tank of known volume (can be the outflow chamber if volume is known) or other as approved by the facility engineer's Hydrogeologist Consultant).

(a) **Mixing alternative 1**: Double surge block with airlift or pump, operated on either a mechanical cable tool rig or pump hoist that provides equivalent reciprocal spudding action (2 ft/sec vertical motion). Pump hoists that provide this action are equipped with frame-mounted hydraulically actuated walking beam (Smeal or equivalent).
(b) Mixing alternative 2: Convention airlift surging. The two-line method (with a 4-inch eductor pipe and 1-inch airline – see example diagram) will improve the ability to pump debris off the well bottom and reduce turbulent abrasion of shales.

(c) Mixing procedure:

i) Following a 12-hr soak, surge (not pumping) for four hours after administering dose of chemicals, moving surge tool up and down across the entire borehole.
ii) Start pumping off after four hr of surging (ii) at up to the known well yield (measured): pumping, recovering and repeating, until pH recovers to about 0.5 pH units of pre-cleaning pH and water is clear. Measure flow rate on the one-half hour.
iii) Airlift develop for two hours after water is clear and pH acceptable.

Note: Air-driven percussive redevelopment (Airburst (Frazier Technologies) or Boreblast (Layne Christensen)), specified in the earlier document (former Alternative 2), is deleted as an alternative.

Environmental safety: The dirty discharge may be acidic. It must be discharged into containment (as described above) and neutralized with lime, soda ash, or magnesium hydroxide to at least as high as pH 6 prior to removal to safe discharge such as an RV dump or sewer. Have on hand 50 pounds of soda ash or equivalent per well. Work with park wastewater personnel to arrange appropriate discharge and provide documentation of safe disposal to the facility engineer's hydrogeologic consultants (Ground Water Science). No contaminated water may be discharged around the well, into surface drainage, or other unapproved location.

(C) Conduct post-cleaning well video

After clearing well, conduct a post-cleaning downhole video of the well. If necessary, employ water column-clearing methods first. The video system shall be in color and provide in-progress switching between down and side view during the inspection. The video system shall provide an image of sufficient quality to permit the facility engineer's hydrogeologic consultants to evaluate borehole condition. A record of the video shall be made on DVD and a copy provided to the facility engineer's hydrogeologic consultants.

(D) Test pumping pump and column pipe installation and testing:

(1) Install test pump sized based on yield estimate from well development airlifting, and its wire and discharge pipe. Connect to an external source of power (generator if needed or line power if correct for pump motor function) and run briefly to check proper function. Block at wellhead for step-drawdown test (Ground Water Science supplies data collecting instruments, collects data and controls test).
(2) Step test standby for well crew approximately 2 hr. (or come back the next day).

(E) Pitless adapter or unit repair and upgrade:

(1) Well 1: After well testing, repair and upgrade pitless unit

(a) Set a plug or packer below the pitless unit.
(b) Dig out pitless unit, detatch, and inspect.
(c) If it is suitable for use, clean the junctions and weld pitless unit to casing, water-tight.
(d) Fit top of pitless unit with mount for vermin-proof and vented cap meeting current state and industry (for example, Water Systems Council) standards.
(e) Inspect and make any necessary repairs to spool and seal.

(2) Well 2: After well testing, install improved pitless adapter (weld-on type providing an unobstructed path into the well casing) and well cap meeting current state and industry standards.

(F) Install or reinstall permanent well pump:

(1) If no change is to be made in well pump at present, reinstall current well pump if functional, with inspected power wire, pump discharge pipe, and necessary check valves. Wire into power, assuring watertight conduit-cap-box junctions and check function.

(2) Alternatively, if a new well pump is to be installed based on the well tests, install with new pump discharge pipe, check valve(s), wire, and controls. The specifications and purchase of this new pump are separate from this well rehabilitation specification.

(3) During or permanent pump installation, mix in a 100- to 250-gal tank: a) 50 gal. clean potable water, 3 gal. 5 % white vinegar or amount of chlorine pH buffer product meant for well chlorination specified by the supplier. Discharge into well after test is completed. b) in 50 gal of clean, potable water, mix 1 gal of fresh 12 % NSF-listed Na hypochlorite and pump into the well piping to below the deepest production zone. c) Rig recirculation into the casing to permit wash down of casing. d) Turn on well pump to mix, check pH, which should be between 5.5 and 6.5. e) Allow to sit for 12 hr, pump off until clear to containment or neutralized and pumped to surface drainage (if approved by the WV DNR) until total chlorine is < 0.2 mg/L by field test.
(4) Once the post-cleaning step-drawdown test and chlorination are completed, reset in pitless unit and restore normal function.

(G) Abandonment Sealing of an Abandoned Water Well and Abandoned Borehole

An abandoned formerly used water well and a borehole that was abandoned while drilling was in progress (reportedly with tools lodged in place) are found in the vicinity of the in-use Wells 1 and 2. At present time, no records of this well and borehole are available. These will be supplied if unearthed. It is assumed that old Well 1 (1960s era) is cased, 6-in. diameter and is similar in depth to wells 1 and 2 (~ 250 ft). The open hole depth of the abandoned borehole is unknown. The State wishes to have these sealed as part of this project scope.
(1) Standards: All well sealing will be conducted in conformance with the requirements of the State of West Virginia for sealing (decommissioning) abandoned wells and boreholes. In the case of the abandoned borehole, tools will be abandoned in place as they are considered irretrievably stuck.

(2) Well and borehole shall be sealed using high solids granular bentonite pumped in under pressure. Grout bentonite shall be a product meeting state standards for a bentonite sealing product, mixed per state requirements and supplier recommendations. A mixing and pumping polymer meeting state requirements and as recommended by the supplier may be used to facilitate mixing and pumping.

(3) The well and borehole shall be accessed, and a path opened into the well bore. Sound the open borehole to obtain a total current depth to estimate necessary sealing bentonite volume.

(4) Mix bentonite slurry and insert rigid tremie pipe.

(5) Using positive displacement pumping, fill the borehole and well space, keeping the tremie pipe submerged and withdrawing as the hole fills.

(6) Pump until bentonite completely fills the borehole to the surface.

(7) Prepare and submit a well abandonment record to the appropriate authorities, copying the Park Engineer's Hydrogeology Consultant.

General Conditions:

Qualifications: Contractor must be a licensed master water well contractor in good standing in the State of West Virginia. Candidate contractors will be required to provide license information upon request and written, verifiable evidence of experience in similar well-cleaning tasks upon request. Contractors will be required to have a written, site-specific health and safety plan available for inspection.

In case of coliform test failure: If a total coliform test is positive twice (or *E. coli* once) after the well is returned to service, repeat the chlorination procedure (Task **F.3**).

Chemical mixing equipment and tanks: Tanks and hoses shall be visibly clean and free of sand or debris from past work. Tanks shall be sufficiently large to handle chemical mixing. Circulation pumps (electrical or motor powered) are needed for mixing and pumping into the well. All equipment shall be safe, resistant to aggressive solutions, and free from leaks.

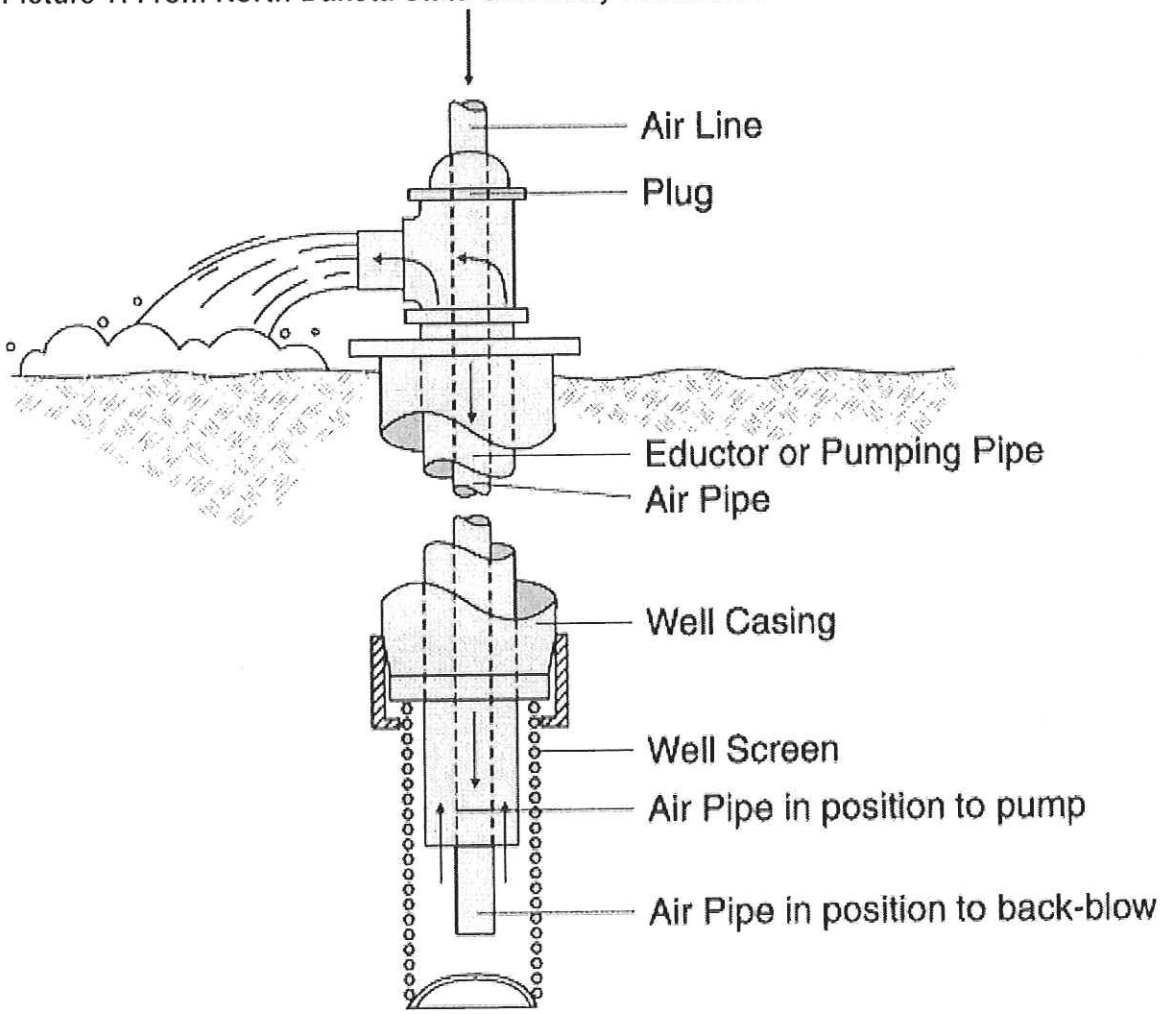
No polyphosphates or phosphoric acids are to be used due to the tendency to degrade in the formation to orthophosphate or organic-P and to stick to clays, providing phosphate nutrient for regrowth of biofouling organisms.

Authority: At the pleasure of the State of West Virginia and the consulting engineers to which it is contracted, Smith-Comeskey Ground Water Science's onsite advisor will advise on and assist with chemical treatment and have final say on solutions, application, site management, and safety issues.

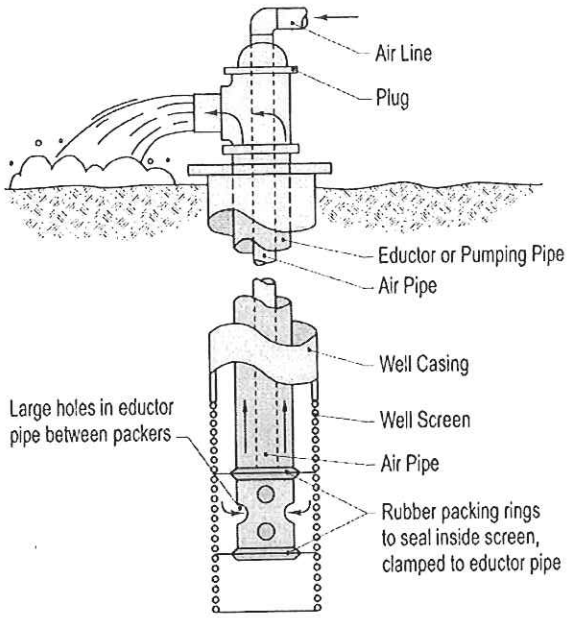
Necessary equipment list, well rehabilitation project

1. Pump hoist (in good mechanical condition) capable of handling the specified tools at the depths and diameters involved, and related tools, **and capable of being deployed at the well sites in question.**
2. Where reciprocal well surging is specified (Alternative 1), the optimal equipment is a cable tool drilling or workover rig in good mechanical condition and capable of handling the specified tools (typically a Bucyrus-Erie 22W or equivalent). Can double as pump hoist. An acceptable alternative is a pump hoist equipped with a frame-mounted spudding beam system in good hydraulic and mechanical repair. The system must be able to surge at two feet/second over a three-foot stroke.
3. Double surge block with airlift or pump (Alternative 1): Descriptions are provided in numerous references. The tool has two surge blocks with heavy rubber gaskets held between steel plates with an intervening pipe perforated to permit exchange of air and water. The rubber should be 1-in. less diameter than the casing. Rubber should be rigid and not a flap. Jointed rigid 3 or 4-in. steel pipe runs to the surface, terminating in a swivel-mounted right-angle discharge. The swivel accommodates an airline that runs through the center of the pipe. A pump may take the place of the airlift system. The swivel is attached to the work over rig's hoisting line. Joints may be added or removed to work parts of the well bore. The right angle pipe discharges to the receiving tank.
4. **Both cable-tool or airlift surging:** Air compressor in good working order and safe, capable of airlifting the well's specified flow rate, plus associated hose and fittings (safe and not leaking), Oil filter on air discharge.
5. Outflow tank, ideally a large baffled mud tank **of known volume of about** 1000 gal) or equivalent for neutralizing chemical and settling developed solids before discharge.
6. A means to measure flow rate while airlift pumping (can be the outflow chamber).
7. **Test pump in working order (motor and pump end) and sized to achieve the goals of the step-drawdown pumping tests.**
8. A 100- to 250-gal. clean tank for disinfectant mixing.
9. Pressure washer for cleaning pipe and equipment.
10. Transfer pump for chemical feed, typically a plastic or stainless steel centrifugal pump such as a shallow-well jet pump (along with fluid-tight and safe hose and fittings.
11. Downhole video camera (as specified): color, on-the-fly down and side view and providing a DVD record.
12. Generator capable of running contractor's electrical equipment. Optionally, as needed, a generator capable of operating the test pump. **This pump-scale generator must produce consistent volt, amp, and phase output.**
13. **All necessary safety equipment and fresh wash water – available at the water treatment plant.**
14. **Tank or tanker truck for removing rehabilitation discharge fluid off site for disposal as needed**
15. **For well abandonment sealing: grouting bentonite mixer and positive displacement pump in good working order, rigid tremie pipe and attachments.**
16. Specification instructions, read by personnel conducting the work.

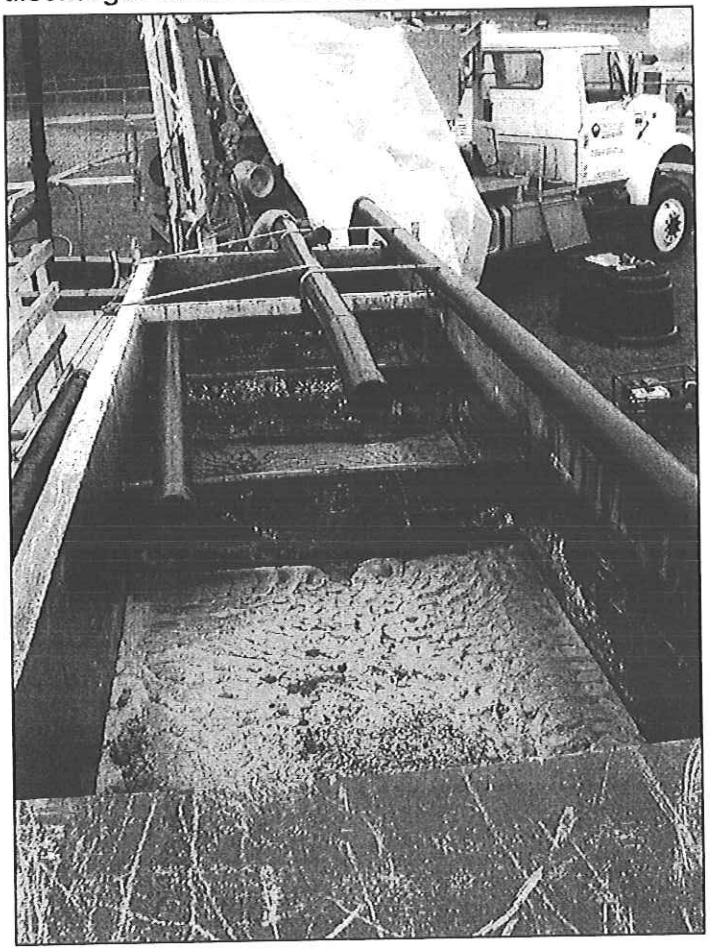
Picture 1: From North Dakota State University Extension:



Picture 2: Double surge-block system diagram (North Dakota State University Extension):



Picture 3: Large surge-neutralizing/settling tank. Airline discharge enters tank and discharges at the back. Outflow flows out through baffled tank through neutralizing chemical as needed and to surface or tank for hauling away. There are various ways to do this, but a tank this size readily treats well cleaning discharge. Hauling should be limited to outflow from the first hour.



06/25/03 10:32 3045582981 SOURCE WATER → 913044575571 NO. 640 001

WV STATE DEPARTMENT OF HEALTH
Office of Environmental Health Services
ENVIRONMENTAL ENGINEERING DIVISION

Well #1

SW258

WELL COMPLETION REPORT

Date(s) _____ County Tucker Permit #: 13,640

Town: _____ Area Name/Location Canaan Valley State Park - Well #1

Well Owner: Wild. Div. of Natural Resources Address: 1210 Harrison Ave.

Telephone Number: 636-0300 Elkins, W. Va. 26241

Well Driller: Frame Drilling Co. Address: P.O. Box 1907

Telephone Number: (636-6025) Elkins, WV 26241

WELL LOG

DEPTH IN FEET	FORMATIONS: KIND, THICKNESS, AND IF WATER BEARING
0-12	Unknown dirt & rock
12-40	Gray Ls. - Crack at 22' with brown mud
40-46	Red Shale - H2O @ 42 GPM
46-47	Gray S.S.
47-58	Red Sh layer with Red Sandy Sh
58-60	Gray S.S.
60-74	Red Sandy Shale
74-78	Red Sh H2O @ 75
78-78.5	Gray Sh.
78.5-81	Red Shale
81-81.5	Gray Sh
81.5-84	Red Shale
84-89	Gray S.S. H2O

REMARKS:

Type of Well: Rock Drilling Method: Hammer Rotary

Well Diameter: 10" Casing O.D.: 6 5/8"

Well Depth: 250' Date Completed: Oct. 31, 1979

CASING: Length 63' Feet Height above Ground 1.5 Feet

Sch 40 Galv. ☒ Steel ☐ Plastic ☐ Cast Iron

Other _____ Type

SCREEN well Inc

☐ None Installed 4" PVC - F-480 from bottom well to approx. 5' below

Type _____ Diameter Sustane

Slot/Gauge _____ Length _____

Set Between _____ Ft. and _____ Ft.

PUMPING OR BAILING TEST

DETAILS	#1	#2	#3
Static Water Level (Ft. Below Grade)	19		
Pumping Rate (GPM)	23		
Pumping Level (Ft Below Grade)	72'		
Duration of Test (In Hours)	3½		
Recovery Time to Static Level (In Hours)	¼		

WELL HEAD 4PS67BNS4CO-A

Pitless Adapter: Type, Make, Etc. Baker Case - Black Steel

Well Cap: Type, Make, Etc. Rapid 2" ID - 7⅝" O.D.

Well Seal: Type, Make, Etc. Quick-connect

Well Platform: N.A.D.

Length _____ Width _____ Thickness _____

Grouting: ☒ Yes ☐ No Entire Length of Casing.

All Public Water Supplies must be grouted. with Bentonite

I hereby certify that this well was drilled and constructed under my supervision, in compliance with all requirements of the referenced permit, and that this record is true to the best of my knowledge and belief

Jack R. Frame II 181

Name Certification No.

Frame Drilling Co.

Registered Business Name

Signature Nov 10, 1979

Date

89-94.5	Red Sh	113-114	Gray SS	139-141	Red Sh
94.5-91	Gray S.S.	114-117	Red Sh	141-147	Red S&Sh
91-91.5	Red Sh	117-120	Gray SS	147-148.5	Red Sh
91.5-98	Gray S.S.	120-121	Red Sh	148.5-?	Red S.S.
98-106	Sandy Gray Sh	121-122	Red SS		
106-107	Red S&.	122-123	Gray SS		
107-113	Alt. Red Sh and Red S&.	123-126	Red & Gray Sh		
		126-129	Gray SS		
		129-129.5	Red Sh		
		129.5-130.5	Gray Ls		
		130.5-133	Red SS.		
		133-135.5	Gray S.S.		
		135.5-139	Red Sh 120		

See attached sheet

permit # 18,640

Canada Valley State Park Well #1

well #1

142.5 – 152	Red Sh with Gray L.S. Stringers
152 – 156	Red Shale
156 – 158	Gray L.S.
158 – 161	Red Sh.
161 – 164	Gray Sh.
164 – 221	Gray L.S.
	175–180 – Altered zone, hard & soft layers.
	182 – Soft 3 inches
	184–185 – soft
	192 – Soft 4 inches
221 – 222	Red Sh
222 – 223	Gray L.S.
223 – 247	Gray L.S (Chunks thrown aside)
247 – 250	Gray L.S. (Cuttings thrown above

06/25/03 11:46 DARK DEMS PHILIPPI DISTRICT [illegible]

06/25/03 10:32 SOURCE WATER → 913044575571 NO.648 007

SW-258

WV STATE DEPARTMENT OF HEALTH
Office of Environmental Health Services
ENVIRONMENTAL ENGINEERING DIVISION

Well #2

WELL COMPLETION REPORT

Date(s) _____ County Tucker Permit # 12640

Town: _____ Area Name/Location Canaan Valley STATE PARK-WHITE

Well Owner: W.Va. Div of Natural Resources Address: 1210 HARRISON AVE.

Telephone Number: 637-0320 ELKINS, W.Va. 26241

Well Driller: Frame Drilling Co. Address: P.O. Box 1907

Telephone Number: 636-6025 Elkins, WV 26241

WELL LOG

DEPTH IN FEET	FORMATIONS: KIND, THICKNESS, AND IF WATER BEARING
0 - 17	Unconsolidated
17 - 50'	Grey S.S.
	Fractured @ 30'
	brown H2O at fractures
50' - 53	Red Shale H2O 3gpm
53 - 56	Grey S.S.
56 - 56.5	Red Sh & Red S.S. layers
56.5 - 60.5	Grey S.S.
60.5 - 69	Red Shale Sh
69 - 80	Red Sh H2O 20gpm
80 - 81	Grey Sh
81 - 84	Red Sh.
84 - 85	Grey Sh
85 - 88	Red Shale

REMARKS:

Type of Well: Rock Drilling Method: Hammer Rotary

Well Diameter: 6" Casing O.D.: 6 5/8"

Well Depth: 250' Date Completed: April 31, 1999

CASING: Length 6.3 Feet Height above Ground 1.5 Feet

Sch. 40 Galv. Steel ☐ Plastic ☐ Cast Iron

Other _____ Type

SCREEN Well Liner

☐ None Installed 4" PVC F-480 From bottom Type _____ Diameter Well to app. 5' below Surface

Slot/Gauge _____ Length _____

Set Between _____ Ft. and _____ Ft.

PUMPING OR BAILING YEST

DETAILS	#1	#2	#3
Static Water Level (Ft. Below Grade)	11'		
Pumping Rate (GPM)	60		
Pumping Level (Ft Below Grade)	187		
Duration of Test (In Hours)	36		
Recovery Time to Static Level (In Hours)	15		

TO 20'/15hr Hill'

WELL HEAD N.A.D.

Pitless Adapter: Type, Make, Etc. N.A.D.

Well Cap: Type, Make, Etc. Royer

Well Seal: Type, Make, Etc. _____

Well Platform: N.A.D.

Length _____ Width _____ Thickness _____

Grouting: ☒ Yes ☐ No Bentonite to the length of casing

All Public Water Supplies must be grouted.

I hereby certify that this well was drilled and constructed under my supervision, in compliance with all requirements of the referenced permit, and that this record is true to the best of my knowledge and belief.

Jack R. Frame II — 181
Name — Certification No.

Frame Drilling Co.
Registered Business Name

Jack R. Frame II — Dec. 10, 1999
Signed — Date

See Attached Sheet For well log to 250'

06/25/03 18:32 SOURCE WATER ♦ 9138445795571 NO.640 008

Permit # 1364

Cannon Valley Sand Rock
well # 2

Well # 2

88-91	Cavy LS.
91-92	Red Sh.
92-93	Cavy LS
93-94	Red Sh.
94-100	Cavy LS
100-110	Sdy Cavy Sh
110-112	Red SS
112-117	Alternating layers of red Sh & red SS.
117-119	Cavy SS
119-121	Red S. Sh.
121-125	Cavy LS
125-126.5	Red Sh.
126.5-127	Red SS
127-129	Cavy SS
129-135	Red & Cavy Sh. H2O 10 gpm
135-137	Cavy SS
137-138	Red Sh. H2O 10 gpm
138-145	Cavy LS
145-155	Red Sandy Sh H2O 5 gpm
155-158	Red SS
158-159	Red Sh
159-162	Cavy LS. wcm and Sh stringers
162-165	Red Sh
165-166	Cavy LS
166-169	Red Sh
169-171	Cavy Sh H2O
171-230	Cavy LS 7 gpm
	Alternating layers of hard & Sdy
230-234	Red Sh
234-250	Cavy LS H2O - 5 gpm
	Bottom zone Fernhaven Rock and bottom of hole.

Fernhaven Rock

Uniform Unit Price Bid Schedule

Item	Unit Price	Estimated Units	Price
Mobilization	$_____	Lump Sum (LS)	$_____
A. Pull 2 well pumps (pumps at 200 ft), discharge line and wire and lay out, pull 2 x 250 ft of 4-in. PVC liner, prep pitless			
Pump hoist/crane truck	$_____ / hr.	16	$_____
Crew labor	$_____ / hr.	16	$_____
Poly sheeting	$_____ / LS	LS	$_____
B. Well Cleaning			
1. Brushing 2 x 250-ft 6-in. wells, airlift (Task B.1)			
Pump hoist/crane truck	$_____ / hr.	8	$_____
Crew labor	$_____ / hr.	8	$_____
2. Chemical Treatment: Vol. depend on treatment alternative chosen			
a.1. Aqua-Clear AE (vol For 2 wells) or	$_____ / LS	60 gal.	$_____
a.2. Soda ash or equivalent	$_____ / lb	100 pounds	$_____
b. Mixing and dosing with chemical solution (Task B.2.d and e)	$_____ / hr.	6	$_____
3. Redevelopment:			
Tasks B.3.a to c Mark whether using ☐ Cable tool or ☐ Conventional airlift surging			
Surging rig or hoist (include tank costs)	$_____ / hr.	42	$_____
Crew labor	$_____ / hr.	42	$_____
Air compressor (if needed) generator (including fuel)	$_____ / week	2	$_____
Generator (if needed) (including fuel) for Task D	$_____ / day	2	$_____
Tank truck for hauling spent fluid	$_____ / week	2	$_____
C. (also A.4) TV Surveys – Vertical and Horizontal (camera & labor)	$_____ / hr.	8	$_____
D. Install and remove test pumps (Tasks D.1-2 for 2 wells)			$_____
Crane/hoist truck (include standby)	$_____ / hr.	14	$_____
Crew labor (include standby)	$_____ / hr.	14	$_____
D. Supply test pumps (well 1 up to 100 gpm and well 2 up to 185 gpm)	$_____ / LS	LS	$_____
E. Repair/upgrade pitless units (Tasks E.1 and E.2)	$_____ / LS	LS	$_____
F. Re-install Existing Pumps (Tasks F.1-4 for 2 wells)			$_____
Crane/hoist truck	$_____ / hr.	8	$_____
Crew labor	$_____ / hr.	8	$_____
Disinfection (all Task F.3)	$_____ / LS	LS	$_____
G. Sealing for 2 Abandoned Wells	$_____ / ft	500	$_____

TOTAL FOR TWO WELLS (REHABILITATION) AND WELL ABANDONMENT $_____

* **Notice to Bidder:** This will be a Unit Price Contract based on your Unit Prices submitted on the included Uniform Unit Price Bid Schedule. Your Unit Prices will be the basis for payment for work performed. The Estimated Project Cost will be the basis for awarding the contract. Hourly wages must conform to Prevailing Wage Rates.

Quotation effective until (date): _____

Signature _____ Date _____

Title _____