

**Change Order****Page 1 of 3****Change Order No. 5****Agreement Date: September 25, 2018****Name of Project:** Otowi 2 Well Design Drilling and Development**Contractor:** Wilson & Company, Inc., Engineers & Architects**Revisions Hereby Made to the Contract Documents:**

The parties, through this Change Order, hereby agree to amend the contract AGR 17-30 ("contract") to increase the contract price by an amount of \$446,490.16, plus applicable NMGR.

**JUSTIFICATION:**

The contractor has made a claim for the cost associated with the additional time it has taken to drill due to the complications from the unforeseen conditions presented by the fissured basalt geological formation. The contractor has presented their actual costs of labor, fuel, per diem and equipment from April 1, 2018 to August 2, 2018, which period represents the timeframe where drilling occurred in the fractured basalt. The contractor has provided a worksheet that compares these actual cost to base contract billable amounts, and deducted any time/materials paid for by other change orders or when equipment was down for repair. The contractor's claim and supporting cost justification is provided as an attachment to this change order. DPU staff has verified the supporting information, invoices and labor costs presented by the contractor in support of their claim and they are an accurate representation of their actual costs.

Due to complications from the presence of the fissured basaltic geological formation, which has continued to cause loss of circulation of drilling fluids, the drilling operation has lasted eight months longer than originally scheduled.

Furthermore, the parties agree that:

1. The current increase and any future increases shall remain subject to the continued funding of the County Council and this Change Order does not alter, amend, or change any other contract term(s), condition(s), or provision(s).
2. The increased contract amount herein provided shall be a *not to exceed amount* and shall include any and all other supplies, costs, materials, services, and expenses necessary to complete the project within the schedule in the contract/agreement terms. Nothing herein shall relieve the contractor from the duty to deliver the project fully functional and within the time and schedule provided in the contracted agreement.

**Page 2 of 3****CHANGE TO CONTRACT PRICE:**

Original Price	<u>\$ 2,583,694.07</u>
Current Contract Price adjusted by previous Change Order	<u>\$ 3,330,339.00</u>
The Contract Price due to this Change Order will be increased by:	<u>\$ 446,490.16</u>
The new Contract Price, including this Change Order will be	<u>\$ 3,776,829.16</u>

**CHANGE TO CONTRACT TIME:****FINAL COMPLETION:**

End of Original Contract Time	<u>Dec 31, 2019</u>
Current Contract time adjusted by previous Change Order(s)	<u>NA</u>
The Contract Time will remain unchanged:	<u>0 calendar days</u>
The date for work's final completion will be	<u>Dec 31, 2019</u>

**APPROVALS REQUIRED:**

To be effective, this order must be approved by the County Utilities Manager; or the Los Alamos County Council if the contract modification, change order, or contract price adjustment exceeds the funding budgeted and specifically appropriated for this project, or as may otherwise be required by the General Conditions.

The adjustment in Contract price and/or Contract time stated in this Change Order shall constitute the total price and/or time adjustment due or owed the Contractor for the work or changes ordered by the Change Order. By executing the Change Order, the Contractor acknowledges and agrees that the stipulated price and/or time adjustments represent full compensation for all adjustments in the cost or the time required to perform the Contract as a whole arising directly or indirectly from the Change Order, including costs and delays associated with the interruption of schedules, extended overheads, delay, and cumulative impacts or ripple effect on all other non-affected work under Contract not changed by the Change Order. Signing of the Change Order constitutes full and mutual accord and satisfaction for adjustments in contract price and/or time, subject to the current scope of the entire work as set forth in the Contract Documents. Acceptance of this Change Order constitutes an agreement between Owner and Contractor that the Change Order represents an equitable adjustment to the Contract, and that the Contractor will waive all rights to file a claim on this Change Order after it is properly executed.

August 16, 2018

Mr. James Alarid  
Deputy Director of Utilities  
Los Alamos County  
1000 Central Avenue, Suite 130  
Los Alamos, NM 87544  
Sent via Email

**Re: Otowi Well #2 – Change Order #4 – Response to Los Alamos County Review**

Dear James,

Wilson & Company, Inc., Engineers & Architects (Wilson & Company) received your review letter for the above referenced change order on August 14, 2018. We have reviewed your comments and questions and have prepared the following clarifications:

**Item 1:**

- Wilson letter represents Layne's requested change order amount is \$388,252.31. Layne's spread sheet and supporting documents request \$293,359.74. Please clarify the correct requested additional payment for the period from April 1, 2018 to June 22, 2018. Additional back-up will be required if more than \$293,359.74.

**Response to Item 1:**

While the total cost of \$388,252.31 was presented in our cover letter, the spreadsheet from Layne that was attached was a previous and incomplete version of their spreadsheet. The intent of the change order is to request an amount through the completion of drilling for the intermediate casing, which occurred on August 2, 2018. An updated spreadsheet summarizing Estimated Costs, Pending CO Revenue, and Approved Billable Revenue is attached. I have reviewed your comments on the Layne spreadsheet attached to the August 14th letter, and incorporated the same review comments and/or responses into the updated spreadsheet for ease of comparison.

**Item 2:**

- Wilson letter requests 15% overhead and profit per the contract. The contract does not have this provision.

**Response to Item 2:**

Per Section W.3. Changes in the Work, Paragraph 1, an "equitable adjustment" shall be authorized by change order. Standard contracting documents as published by the Engineers Joint Construction Document Committee (EJCDC) and American Institute of Architects both include provisions to account for overhead and profit:

- EJCDC: <sup>1</sup>Standard General Conditions of the Construction Contract - Article 12 – Change of Contract Price, Change of Contract Times, Paragraph C.2.a sets the contractors fee at 15-percent.
- AIA: <sup>2</sup>General Conditions of the Contract for Construction - Article 7, Paragraph 7.3.3.3 – Costs to be determined in a manner agreed upon by the parties and a mutually acceptable fix or percentage fee or as provided in Subparagraph 7.3.6. – Subparagraph 7.3.6 includes provisions that adjustment shall be determined by the architect (engineer) on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit.

Our interpretation of the contract between Los Alamos County and the Wilson & Company project team is that an equitable adjustment of the contract will include overhead & profit, and per the references cited above there is precedence for that overhead & profit to be percentage based, with 15-percent being commonly used.

**Item 3:**

- The daily prices demonstrated by Layne for labor, equipment and diesel total \$6,992.76. In the Layne spread sheet the value used per day is \$7,762.76. Can you explain the difference? Per-diem is already included in the "approved billable" column and should not be included in this daily cost (see attached).

**Response to Item 3:**

The \$770.00/day difference between the \$7,762.76 and the \$6,992.76 covers the per diem the \$770.00/day is \$110/man/day which is \$30/day for meals and \$80/day for lodging. See attached email from Layne.

**Item 4:**

- The calculated cost of \$293,359.74 does not include the deduction for equipment issues in the amount of \$54,339.32 (see attached). This amount should be \$239,020.41. Revisions should reflect this deduct.

**Response to Item 4:**

The updated Layne spreadsheet as attached presents the correct costs with the \$54,399.32 deducted. A total cost of \$1,042,917.29 incurred as of August 2, 2018. Minus the deduction of

---

<sup>1</sup> Engineers Joint Construction Document Committee (EJCDC) Document C-710 Standard General Conditions of the Construction Contract, Funding Agency Edition, 2002

<sup>2</sup> American Institute of Architects (AIA) Document A201-1997; General Conditions of the Contract for Construction



\$54,399.32 equals an adjusted amount of \$988,577.97 (Cost Less Days Deducted.) The \$388,252.31 (excluding 15% markup) requested is equal to the Cost Less Days Deducted minus the Total Billable Amount of \$600,325.67.

**Item 5:**

- We have compared the “pending change order revenue” values. An additional \$16,244.98 has been approved and not accounted for in the spreadsheet (see attached). Please revise.

**Response to Item 5:**

Upon review of your hand-written comments on the Layne spreadsheet originally attached to Change Order #4, we believe that all but \$1,800.00 of the \$16,244.98 is accounted for in the updated Layne spreadsheet attached. Please see my attached comments on your review notes for further clarification. The \$1,800.00 that is unaccounted for is from Change Order #2 cement Job #4. Change order #2 was authorized before completion of cement job #4 so actual cementing costs were not included in Change Order #2. This \$1,800.00 was accounted for in my supplemental email sent to you on August 13, 2018 that summarized project deductive costs for Change Orders #1 and #2. As such we have not included it in the spreadsheet for Change Order #4.

Should you have any additional questions on the revised spreadsheet or our responses above, please feel free to contact me directly, (505) 948-5212, [bjambrogi@wilsonco.com](mailto:bjambrogi@wilsonco.com).

Respectfully,

WILSON & COMPANY

A handwritten signature in blue ink, reading "Brian J. Ambrogi".

Brian J. Ambrogi, P.E.  
Water and Wastewater Manager

Cc: Patricio Guerrerortiz, P.E. – Los Alamos County  
Steve Costello – Layne  
Dan Aguirre, P.E. – WILSON & COMPANY



June 22, 2018

Brian J. Ambrogi, PE  
Water and Wastewater Manager  
Wilson & Company, Inc. Engineers & Architects  
4900 Lang Ave. NE  
Albuquerque, NM 87109  
Via Email: Brian.Ambrogi@wislonco.com

CC: Roger Peery, CPG, PG  
CEO/Principle Hydrogeologist  
John Shomaker & Associates  
2611 Broadbent Parkway NE  
Albuquerque, NM 87107  
Via Email: rpeery@shomaker.com

CC: James Alarid  
Los Alamos County  
101 Camino Entrada, Building 3  
Los Alamos, NM 87544  
Via Email: james.alarid@lacnm.us

Re: Request for Compensation & Equitable Path Forward – Otowi 2 Well

Sent via email

Dear Mr. Ambrogi,

The intent of this letter is to provide a summary of work and cost to date and justification for Layne to request compensation for services provided and also an equitable pricing structure for the remaining effort required to complete the project.

### **Summary of work to date**

Layne commenced drilling operations on the Otowi No. 2 water well on January 16, 2018 after rigging up over a 44' surface casing installed by our subcontractor using the solid stem auger drilling method. As with any water well program specified to be drilled with the flooded reverse circulation drilling method, Layne mixed our drilling fluids in a steel reserve pit at the surface and flooded the surface casing and commenced drilling. Layne first encountered lost circulation just 9 feet below the bottom of the surface casing at 53 feet. Layne contacted the local Halliburton drilling fluid engineer and had him come to the site to help remedy the issue to no avail. The entire premise of flooded reverse circulation drilling is the borehole walls become stabilized with the addition of special drilling additives which not only stabilize the bore hole but also help carry the drill cuttings up to the surface as the boring is advanced. As the drilling fluid circulates up to the surface through the drill pipe and then back down

the annular space between the drill pipe and the borehole walls, the cuttings are removed by a shaker system on top of the steel drilling fluid reserve pit above the ground surface. Only clean drilling fluid which is checked routinely by the crew is allowed to flow back down into the boring. Because Layne's drilling fluid was continuously being lost to voids in the fractured basalt formation, it became evident that we could not advance the boring using the flooded reverse drilling method. After numerous attempts to seal the fractures the discussion of alternative drilling methods ensued.

In the interest of keeping the project moving forward Layne and Shomaker and Associates discussed the possibility of using alternative drilling methods to advance the boring beyond the fractured basalt zone which was estimated to terminate near 250 feet where the beginning of the Puye formation was expected to be encountered. The proposed solution to the loss of circulation issue was to convert the drill over to dual tube reverse circulation (DTRC) using air rather than drilling fluids. The theory behind this was that we could drill into the fractured rock and the drill cuttings would be lifted to surface with air. Dual tube reverse circulation is a proven drilling method however it is more common in exploratory drilling where smaller borings are drilled in order to obtain information about unknown geology. The smaller borings are more conducive to this method because the compressed air volume and pressure demand is less than large diameter borings. Layne informed the team that with some modifications to the drill onsite, we could pull the tooling together to attempt to drill through the upper portion of the Otowi No. 2 well using this method. Due to the uncertainty of how the drilling would progress, Layne proposed to move forward with the work on a time and material basis. Due to the open ended pricing structure of said proposal Layne was asked to provide footage rate pricing to better define the project budget. The assumptions made on the DTRC with air proposal were that the entire upper portion of the well, from the surface casing at 44' below grade to the target depth bottom of the basalt layer at 250 feet below grade, could be drilled with one single 17.5" pilot hole pass, followed by one single 34" ream pass. Layne's proposal to convert the rig to DTRC was accepted and the tooling was mobilized to the site. After two days of DTRC drilling we had made more footage than the two weeks where we attempted to drill using the flooded reverse method. At 168 feet some large vertical fractures later viewed by a Los Alamos County video camera kept us from being able to remove cuttings from the hole. Multiple fixes to the issue were attempted however we could not advance the boring any further due to lack of cuttings being lifted the surface. Either the cuttings were going out into the formation or they were being suspended in air up the borehole. Due to the risk of the cuttings falling in on the down hole tooling when the air was turned off to make a drill rod connection, it was decided to ream down to the problem area and cement. As mentioned above a down hole video documented fractures that would prevent us from keeping circulation in any particular zone for more than 10 or 20 feet at a time. Cement jobs followed by reaming became the procedure for April and half of May.

In mid-May after reaming through a previously cemented zone down to ≈158 feet Layne went back to pilot hole drilling and advanced the boring to 243 feet to where the rock seemed to be less fractured and more competent. At this point Layne ran in a down-the-hole hammer with a 19" bit to drill through the hard rock. In a matter of three days we had advanced the pilot hole more than 100 feet and had drilled out of the basalt and into the Puye formation. We hammer drilled into the softer Puye formation successfully to a depth of 387 feet when the boring started to collapse. This confirmed what we had



already been told, that the Puye formation would need to be drilled using the flooded reverse drilling method so that the hydrostatic head would keep the boring from collapsing. However, in order to drill the Puye formation with a flooded boring, using the flooded reverse circulation drilling method, we would have to seal off all of the fractured zones above.

On May 18<sup>th</sup> we went back in with a 34" reamer to ream the cement we had drilled a pilot hole through. We call the process "dry reaming" because the borehole is dry and the cuttings just fall down into the pilot hole below, allowing the pilot hole to be reamed without having to bring the cuttings to the surface. The cuttings or "fill" is later removed fairly easily when circulation is restored above. On May 22<sup>nd</sup> we had dry reamed the 34" hole down through all of the cement and were back to native formation. Because of the good results of the 19" hammer drilling we ran in our 30" down-the-hole hammer with 33.75" bit. Despite being machined to fit in the 34" boring, the hammer was getting hung up on the cemented borehole walls as the crew attempted to get it down to the bottom of the boring at 206' feet. As is our typical protocol when it comes to risky operations, we chose to err on the side of caution and run in two rotary reamers in order to clean up the borehole walls rather than getting the large bodied hammer stuck at a later date. When the large hammer was installed we were unable to successfully drill with it. We had already started discussions about using an alternate lost circulation material (LCM) that one of Layne's internal engineers had recommended after monitoring our struggles since January.

On May 29<sup>th</sup> the use of the Diseal LCM product was officially rejected by the County after checking in with local environmental agencies. Due to lack of NSF certification the product could not be used during the construction of a water well despite it being proposed for use above the anticipated production zone. With this news Layne proposed cementing back the upper portions which had been stabilized but not completely sealed enough to prevent losses of air or fluids.

Thus far in June of 2018 the crews have been cementing and re-drilling their way down the hole while ensuring each zone is water tight as they advance it order to ultimately drill the Puye formation using the flooded reverse method. The last lost circulation episode occurred in the early morning hours of June 21 as the crew approached the depth of 320 feet with the 34" reamer. After discussing with Wilson and Shomaker, it was agreed once again that cementing and re-drilling was the only course of action.

## **Justification**

Layne continues to maintain the assertion that the subsurface conditions encountered at Otowi Well No. 2 were not reasonably anticipated and therefore meet the criteria of differing site conditions. In the interest of moving the project forward Layne offered a potential solution to get past a particularly difficult zone below the surface casing and through the fractured basalt layer. Observations made at a later date, such as audible air flows the drillers could hear when the wind blows, as well as video footage, support the case that the geology is not conducive to conventional water well drilling methodologies and techniques. Layne has extensive experience drilling under lost circulation



conditions and very rarely do we find ourselves in a situation where cementing back a previously drilled interval is required. Let alone having to take these measures seven times in a boring as shallow 300 feet.

At this stage Layne has spent more time than we anticipated drilling the entire well on the upper ≈300 feet of the Otowi Well No. 2. This is documented by looking at our original project schedule where the estimated days to complete the entire 2500 foot well was ninety days. The DTRC efforts were also estimated assuming the change in methodology would overcome the difficulties caused by fractures anticipated to be much smaller than what was encountered and later observed. Layne has made every reasonable effort to allocate the necessary resources to make progress on this project. At this time our financial forecasts show a trend of an increasingly large gap between our estimated cost to completion and what the contract will allow us to invoice for. We have compiled a table that shows the comparison between cost and billable work along with a brief description of the crew's efforts on a daily basis beginning on April 1 when DTRC drilling commenced, through today. We are requesting relief for the additional cost that is above what we'll be able to invoice for. We have included some concessions as admittedly there were days when progress was less than desired. Had our big hammer worked as well as the 19" hammer one could argue we would be weeks ahead of where we stand today. Despite this, the efforts did not provide results and therefore we have omitted these dates from our request for compensation along with a couple of other days where equipment issues hindered progress.

### Summary of Cost

The summary of cost attached is specific to the period from April 1, 2018 to date. We understand there is not a milestone in clear site and therefore costs to complete the project remain dynamic. What we do know is the cost to get this far have far exceeded realistic expectations and have shown only slight signs of improving. If the gap between Layne's cost and revenue can't be resolved at this date, it isn't reasonable to expect it be resolved later and therefore other options must be considered. We appreciate your willingness to review our claim and look forward to sitting down face to face and coming up with a path forward on this project.

Sincerely,



Steve Costello

**LAYNE** | water + mineral + energy

General Manager, Water Resources  
Chandler, AZ

Date	Estimated Cost	Pending CO Revenue	Approved Billable Revenue	Description of work	PILOT DEPTH	REAM DEPTH	RE-DRILL
1/16/2018				Drilled 9' from 44' surface casing to 53'. Fought lost circulation right out the conductor - charged hourly			
1/17/2018				Drilled 7' from 53' to 60'. Fought lost circulation right out the conductor - charged hourly			
1/18/2018				Fought losses with bentonite per mud engineer recommendation. No hole			
1/19/2018				Down to 77' drilling and fighting losses			
1/20/2018				Down to 93' hit void from 90 - 93 continued trying to fight			
1/21/2018				Mixing LCM and bentonite - fighting LC			
1/22/2018				Mixing LCM and bentonite - fighting LC trying to drill			
1/23/2018				Crew tried mixing cement to plug with no luck. We called Time Out at progress meeting			
1/24/2018				Water Watch and equipment maintenance			
1/25/2018				Water Watch			
1/26/2018				Water Watch			
1/27/2018				Water Watch			
1/28/2018				Drained pit and tanks before crew went home for indefinite break			
1/29/2018				Crews traveled home			
1/30/2018				Cost for crews to return			
1/31/2018							
2/1/2018				Coffer's update said all personal is off site			
STOPPED				<b>Discussed plan to move forward Feb - March</b>			
3/28/2018				Rig up to drill dual tube reverse air			
3/29/2018				Rig up to drill dual tube reverse air			
3/30/2018				Rig up to drill dual tube reverse air			
3/31/2018				Broke tours to start drilling dual tube			
4/1/2018	\$7,762.76		\$1,160.00	Started drilling 17.5 pilot with air - 4 compressors. <b>Start 97 feet</b>			x
4/2/2018	\$7,762.76		\$1,160.00	Drilled 17.5 pilot with air to 151 stopped getting returns. <b>54' drill dual tube</b>			x
4/3/2018	\$7,762.76		\$2,414.00	After pulling tools to check for plugging drilled to 159 - 3 compressors. <b>(6' of dual tube drilling Starting at 153 per CO)</b>	159	53	
4/4/2018	\$7,762.76		\$3,849.00	Drilled 17.5 with air to 168 and cuttings were going to void. <b>9' of DT drilling</b> Suggested cementing. WC reamed 34" from 42 - 46 feet. <b>4' DT Ream</b>	168	53	
4/5/2018	\$7,762.76		\$4,796.00	Started reaming 34" so we could cement and stabilize cutting .5'/hr. Drilled 46 to 64' = <b>18' of 34" DT reaming</b>	168	64	
4/6/2018	\$7,762.76		\$3,988.00	Reaming native formation 34" with air. Drill 64' to 78 feet. .75'/hr 1 compressor. <b>14' DT Ream</b>	168	78	
4/7/2018	\$7,762.76		\$2,978.00	Reaming native 34" with air. Drill 78 to 87 feet. .4'/hr 1 compressor. <b>9' DT Ream</b>	168	87	
4/8/2018	\$7,762.76		\$7,018.00	Reaming native 34" with air. Drill 87 to 116 feet. .6'/hr 1 compressor <b>29' DT ream</b>	168	116	
4/9/2018	\$7,762.76		\$1,968.00	Reaming native 34" with air. Drilled 116 to 120 feet .5'/hr 1 compressor <b>4' DT ream</b>	168	120	
4/10/2018	\$7,762.76	\$16,515.00	\$1,160.00	Pulled tools and cemented from 120 to 64 with 18 yards. County offered camera via email after we decided to cement. Allow cement to set. Drill 17.5" hole through cement from 64' to 81'. <b>Work on swivel then trip out.</b>	168	120	
4/11/2018	\$7,762.76		\$1,160.00	Crew mixed cement and brought it up into conductor. Cemented 120 to 38' on this first legit cement stabilization effort.	168	120	
4/12/2018	\$7,762.76		\$1,160.00	Tagged cement at 38' and drilled 17.5" flooded RC 8' per hour to 124' (just below cement) and lost circulation	168	120	
4/13/2018	\$7,762.76	\$4,554.00	\$1,160.00	Pulled 17.5" pilot tools and made up reamer. Start drilling 34" at 38'. Reamed 34" flooded reverse to 75'. <b>33' Cement 34" redrill (\$138/ft)</b>	168	120	
4/14/2018	\$7,762.76	\$3,174.00	\$1,160.00	Reaming 34" flooded reverse. Drill cuttings (cement) were knocked down hole allowing crew to flood hole and drill flooded RC. Drilled 34" Flooded RC to 98' and then lost fluids. <b>23' Cement 34" redrill (\$138/ft)</b> Tripped out to go back to 17.5" dual tube air	168	120	
4/15/2018	\$7,762.76		\$1,160.00	Got set up to drill 17.5" dual tube. Started drilling pilot from 98 to 147. Back drilling below cement at 120 but pilot had been drilled to 168 previously.	168	120	

4/16/2018	\$7,762.76		\$2,623.00	Drilled 17.5" dual tube to 175' stopped getting cuttings back to surface and arranged to run County's camera. 147 to 175' = <b>28' 17.5" dual tube. 7' of billable new hole at DT rate.</b> Ran camera in open hole to 150 (didn't want to enter dirty water at 150 to see down to 175' current TD.	175	120
4/17/2018	\$7,762.76	\$1,794.00	\$1,160.00	Everyone watched video and discussed on progress call. Decided to ream again and cement fractured/possibly unstable ledges observed. Crew prepared to ream 34" dual tube. Target depth of 150 or as far as we can go and then cement. Reamed 98 to 111 over night. 1.8'/hr drilling concrete with 1 compressor.	175	120
4/18/2018	\$7,762.76	\$1,242.00	\$3,786.00	1st Shift - Reamed 34" DT from 99'-118' , 2nd Shift - reamed 34" 118-133. <b>2' at cement redrill and 13' @DT rate.</b>	175	133
4/19/2018	\$7,762.76		\$3,786.00	1st Shift - Reamed 34" DT from 133'-146'. <b>13' @ DT rate.</b> 2nd Shift - video log and make up 17.5	175	146
4/20/2018	\$7,762.76	\$15,748.13	\$1,160.00	1st Shift - Move table, hang 17.5" bit on conductor, install table, pull bit through table, and trip in to 159'. Clean out fill, Kelly down, check to see if hole is clear but keep loosening 5', drill down and repeat. Trip out 17.5" bit. Check equipment hours. Run 3 loads of cement trucks. 2nd Shift - Finish cement pour- organize jobsite for pipeline crew- change oil in rig, 3 compressor's, 2 generator's- weld up access hole to well- sound cement at 79' GL	175	146
4/21/2018	\$7,762.76	\$3,600.00	\$1,160.00	1st Shift - Break 17.5" bit, makeup 17.5" roller bit to bit assembly, lay down. Move table; pickup and lower bit assembly; install table; lift bit assembly through table; and trip in to 78'. 2nd shift - Drilling with dual tube air, drill 17.5" hole from 78'- 106'- flush out drill string with fresh water at KELLY down- weld patch on leaking discharge pipe- weld 2" collar on conductor to introduce water to hole while making connection.	175	146
4/22/2018	\$7,762.76		\$1,160.00	1st Shift - Drill out cement, 17.5" borehole from 106' to 126'. 2nd Shift - Drilling with dual tube air, drill out cement from 126'- 146'. <u>repair leak on kelly gooseneck</u>	175	146
4/23/2018	\$7,762.76		\$1,787.00	1st Shift - Drill out cement, 17.5" borehole from 146' to 152'. Table keeps locking up and not drilling off. Trip out 17.5" bit, check bit and trip back in. Drill out cement 17.5" from 152'-153'. 2nd Shift - Drilling with dual wall pipe and big air, 17.5" hole drilling out cement from 142'- 144'/clean out fill from 144'- 177'/ drill new hole from 177'-178'. check all oil replace broken driveline bolts on rig drivetrain <b>3' @ DT rate</b>	178	146
4/24/2018	\$7,762.76		\$1,160.00	1st Shift - Drill 17.5" borehole from 178'. Table keeps locking up and not drilling off. Kelly stuck, work free. Trip out 17.5" bit- bit plugged,Breakdown bit, roller bit, interchange to pressure wash and clean bits. Setup and run video log. Cut rings for interchange sub to replace rubbers. 2nd shift - Repack Kelly swivel- <u>identify faulty DC with bad inner tube-</u> assemble DHA of 17.5" button bit with swab rubber's above interchange-run tool's break circulation and advance bit to bottom of hole while shipping off foam from circulation pit	178	146
4/25/2018	\$7,762.76		\$4,086.00	1st Shift - Clean out fill. Drill 17.5" hole from 178' to 186'. Run deviation survey @ 160' : 0.3°. Service equipment @ 9:30 AM. Haul water. Drill 17.5" hole from 186' to 188'. Vac truck one load of drill fluids. 2nd shift - Run 17.5" button bit from 188'-192' <b>14' @ DT rate</b>	192	146
4/26/2018	\$7,762.76		\$1,787.00	1st Shift - Dual wall drilling flooding backside. Drill 17.5" hole from 192' to 195'. Trip out bit. 2nd Shift - Break down 17.5" DHA- pick up 19" hammer, plumb it to air and test fire(no fire at bit)- lay down hammer- assemble 34 x22" reamer assembly, cut down conductor and run in tool's, <b>3' @ DT rate</b>	195	145
4/27/2018	\$7,762.76		\$1,160.00	1st shift - Dual wall drilling dry. Ream 34" hole from 78' to 86'. 2nd Shift - Dry ream (no circulation) 34" hole from 88'-98'.	195	145
4/28/2018	\$7,762.76		\$1,160.00	1st Shift - Dual wall drilling dry. Ream 34" hole from 96' to 107'. Trip out 34" reamer, 2nd Shift Clean cellar of excessive mud from bit being stuck-break down 34" DHA and add 17.5" milltooth- weld rotating head back in an run tool's to 102'- drill by flooding backside( hole taking excessive water, unable to slow down water usage with mud product's)- switch to direct air and advance tool's to 127'.	195	145

4/29/2018	\$7,762.76	\$0.00	\$1,160.00	1st shift - Dual wall drilling. Drill 17.5" hole from 127' to 155'. Trip out 17.5" bit and start working on tripping in hammer bit. 2nd shift - Using 19" hammer and dual wall pipe, ream 19" hole from 102'-170'.	195	145
4/30/2018	\$7,762.76		\$1,369.00	Drilling with air hammer from 195'-196'. Not enough air to fire hammer and lift cutting's/ pull hammer, assemble 17.5" button assembly and run in hole. <b>1' @ DT rate</b>	196	145
5/1/2018	\$7,762.76		\$6,594.00	1st shift - drill 17.5" DT 196-209, 2nd - drill 17.5" 209'-222'. <b>26' @DT rate/</b>	222	145
5/2/2018	\$7,762.76		\$1,996.00	1st Shift 17.5" DT 222-226. 2nd- 19" 196-215. <b>4' @ DT rate</b>	226	145
5/3/2018	\$7,762.76		\$1,160.00	1st: 19" 214-224. 2nd: maint.	226	145
5/4/2018	\$7,762.76		\$1,160.00	1st: maint. 2nd: re-ream to 226	226	145
5/5/2018	\$7,762.76		\$4,713.00	1st" 19" 226-243. 2nd: Make up 34". <b>17' @DT rate.</b>	243	145
5/6/2018	\$7,762.76		\$1,160.00	1st" 34" 102-108. 2nd - 34" 108-124.	243	145 x
5/7/2018	\$7,762.76	\$3,588.00	\$1,968.00	1st: 34"125-135. 2nd: 34" 134-150. <b>4' @DT rate</b>	243	145 x
5/8/2018	\$7,762.76	\$21,030.00	\$1,160.00	1st: maint. 2nd: cement 148'-130'	243	145 x
5/9/2018	\$7,762.76	\$276.00	\$1,160.00	1st: Wait for cement for set, monitor and tag @ 129'; 2nd: clean out cement from 129' to 149'	243	145 x
5/10/2018	\$7,762.76		\$1,160.00	1st: housekeeping, maint; 2nd:maint, trip in tooling	243	145 x
5/11/2018	\$7,762.76		\$1,160.00	1st: Drill out cement with dual wall air. Drill 17.5" hole from 117' to 173'. Clean out hole turn off air to ensure hole is clear for connection' 2nd: Drill 17.5" hole with air from 173'-235' (drilling out fill)	243	145 x
5/12/2018	\$7,762.76		\$1,160.00	1st: Drill out cement with dual wall air. Drill 17.5" hole from 224' to 243'. Ream 34" hole from 119' to 122'. 2nd: Dry Ream 34" bit from 122'-140',	243	145 x
5/13/2018	\$7,762.76		\$3,382.00	1st: Ream 34" hole from 140' to 151' 2nd: Dry Ream 34" hole from 151'-156' ; <b>11' @ DT rate</b>	243	156
5/14/2018	\$7,762.76	\$9,978.75	\$1,968.00	1st: Ream 34" hole from 156' to 160'. 2nd:Cement 34" hole from 158' to 144. <b>4' @DT rate</b>	243	160
5/15/2018	\$7,762.76	\$1,380.00	\$1,160.00	1st & 2nd : redrill to 160', clean out fill	243	160 x
5/16/2018	\$7,762.76		\$14,118.00	1st: Drill out cement 17.5" hole from 200' to 243'. 2nd: Hammer drill (19.25") from 243-305. <b>62' @DT rate</b>	305	160
5/17/2018	\$7,762.76		\$13,700.00	1st: Pilot 305-365, 2nd: change out tooling. <b>60' @DT Rate</b>	365	160
5/18/2018	\$7,762.76		\$3,668.00	1st: Drill 17.5" pilot hole from 365' to 377', 2nd: change tooling. <b>12' @DT rate</b>	377	160
5/19/2018	\$7,762.76		\$1,362.00	1st: Dry ream 34" hole with dual wall pipe from 144' to 150'. 2nd: Dry ream 34" hole from 150'- 161/ <b>1' @ DT rate</b>	377	161
5/20/2018	\$7,762.76		\$2,574.00	1st: Dry ream 34" hole from 160' to 162', 2nd: Dry ream 34" hole from 162'-168'/. <b>7' @ DT rate</b>	377	168
5/21/2018	\$7,762.76		\$6,008.00	1st: Dry ream 34" hole from 168' to 183'. 2nd: Dry ream 34" hole from 183'- 192'. <b>24' @ DT Rate</b>	377	192
5/22/2018	\$7,762.76		\$3,786.00	1st: Dry Ream from 192-200, 2nd:Dry ream 34" hole from 198'-205'. <b>13' @ DT rate.</b>	377	205
5/23/2018	\$7,762.76		\$1,362.00	1st: dry ream 34" to 206', 2nd: Make-up and strap 33.75" center return hammer <b>1'@DT Rate</b>	377	206
5/24/2018	\$7,762.76		\$1,160.00	1st: DTH ream 34.75 to 150', 2nd: Dry ream hole from 140'-150'/ Pull tool's assemble DHA of 34" reamer, Drill collar, 34" reamer. Strap all DC's and sub's. find a sub that won't shoulder down on second reamer assembly	377	206
5/25/2018	\$7,762.76		\$1,160.00	1st: break collar off, break subs, lay down, secure collars in hole, clean site, grind bevel on DTH bit. 2nd:	377	206
5/26/2018	\$7,762.76		\$1,160.00	1st: Dry Ream from 150-190, change lights on Backhoe, dirt work to get trailer of LCM onsite, test 2nd: Dry ream 34" double reamer to 187' (hit fill) pull tool's to 105' and reream to 168'	377	206
5/27/2018	\$7,762.76		\$1,160.00	1st: Dry ream, pull collars and bit stack, run 34" hammer and 6 collars, weld rotating assembly, install ring in clam shell, 2nd :Run 33 3/4" hammer to 156' hammer laying off weight, Kelly up and work hammer to 194', cleaning out fill from 185'. at 194' hammer not working correctly, pull tool's to inspect	377	206

				1st: Pull collars, pull hammer, pull rotating head, test fire hammer (hammers fine), break down 2 reamers, lead bit and 4 subs, set up welder to fix innerchange. 2nd: while welder is repairing inter-change, weld-on conductor for rotating head, break down sub's on drill collar's and install new inner tubes- make up 17.5" milltooth and run in tool's to 194'- attempt to break circulation by flooding backside with water and 4 compressor's, no circulation and out of water	377	206	
5/28/2018	\$7,762.76		\$1,160.00				
5/29/2018	\$7,762.76		\$1,160.00	1st: attempt circ video, 2nd: prep for LCM	377	206	
5/30/2018	\$7,762.76		\$1,160.00	1st: prep for reverse circ, 2nd: prep mud system	377	206	
5/31/2018	\$7,762.76		\$1,160.00	1st: prep wait on approval for LCM, 2nd: work on mud system	377	206	
6/1/2018	\$7,762.76		\$1,160.00	2nd: gravel pack to 170'- poor boy cement mix(13 to 14 lb,cement) to 115'- hook up compressor air to well head and pressure conductor, conductor holding air	377	206	
6/2/2018	\$7,762.76		\$1,160.00	1st: Monitor well head pressure. Tag cement at 2am at 115' add water of 3 minutes came up to 109' and monitor it stayed at 109' . Add water for 15 minutes came up to 100' and monitor it drop 4' to 104' stayed right there. Add gravel up to 106' cement up from 106' to 100' .Hook up head pressure. Wait let cement dry. Check hour a half cement harder up. Add water for 5 minutes came up to 81' and monitor it. Slow drop to 95'. Add cement from 100' 90' hook up to pressure up hole.1st batch cement 14 weight 106'- 100' 2nd batch cement 14 weight 100' - 90' 2nd: Apply air to well head for 2 hour's, sound cement at 99' (dropped 9') flood hole with water and monitor water drop- cement from 99' to 60'- hook up pressure head and load hole with compressor air for 2 hour's	377	206	x
6/3/2018	\$7,762.76	\$64,333.29	\$1,160.00	1st: Tag cement at 65.Add water for 8 minutes came up to 50' and monitor it. Water drop to 56'.Gravel pack from 65'-58'.Add 10 bags of fine sand. Cement 58'-48' 1st batch weight 14. 2nd batch cement weight 14 48'-41'. Hook up head pressure. Turn on air at 75 psi slowly bleed of.8am shut off air tag cement at 54'. 1st batch cement weight 15 54'-48'2nd batch cement weight 15 48'-43Hook air pressure up hole start with 75 psi and drop down to 55psi in 50 minutes. Keep monitor air pressure. 2nd:keep pressure on well head until cement arrival- sound cement at 44'- poor boy cement mix from 44'-37'- pressure well head, well holding 150 psi- maintain pressure for 8 hours- clean jobsite, haul water, bring empty trailer for matrix pipe	377	206	x
6/4/2018	\$7,762.76		\$1,160.00	change to flooded reverse	377	206	x
6/5/2018	\$7,762.76		\$1,160.00	1ST: Drilling out cement w/17.5 44'-63'. 2nd: Drill 17.5" pilot hole thru cement from 63'-115'	377	206	x
6/6/2018	\$7,762.76		\$1,160.00	1st: 17.5 115-165, 2nd: 166-237'	377	206	x
6/7/2018	\$7,762.76		\$1,160.00	Flooded reverse drill 17.5" hole from 238' to 268'.	377	206	x
6/8/2018	\$7,762.76		\$1,160.00	1st: Cement from 245' to 180'. 2nd:Poor boy cement pour thru trim pipe from 180'- 148'	377	206	x
6/9/2018	\$7,762.76		\$1,160.00	1st: Gravel pack 156'-126', Cement hole 122'-95, 2nd: Drill 17 1/2" hole through cement from 95' to 119'	377	206	x
6/10/2018	\$7,762.76		\$1,160.00	1st: Drill out cement with 17.5" bit from 119' to 195'. 2nd: Drill 17 1/2" hole from 195' to 255' Once through cement (at 245') hole held water pretty well.	377	206	x
6/11/2018	\$7,762.76	\$20,786.32	\$1,160.00	1st: Drill out cement/fill with 17.5" bit from 255' to 300'. 2nd: Ream 34" hole from 38' to 49'	377	206	x
6/12/2018	\$7,762.76		\$1,160.00	1st: Ream out cement with 34" reamer from 49' to 89'. 2nd Reamed 89 to 124'	377	206	x
6/13/2018	\$7,762.76		\$2,978.00	1st: Ream out cement with 34" reamer from 124' to 190'. 2nd: 34" ream from 190' to 215' (9' @ DT rate)	377	215	
6/14/2018	\$7,762.76		\$2,372.00	1st: Ream 34" hole from 215' to 221'. (6' @ DT rate) 2nd: Drill 17 1/2" hole from 224' to 285'	377	221	
6/15/2018	\$7,762.76		\$3,988.00	1st: Drill 17.5" hole through cement from 285' to 290'. Cement seal at 300'Ream 34" hole from 221' to 224'. 2nd: 34" ream from 224'- 235'. (14' @ DT ream rate)	377	235	
6/16/2018	\$7,762.76		\$3,180.00	1st: Ream 34" hole from 235' to 239'. 2nd: 34" 239'-245' (10' @ DT ream rate)	377	245	
6/17/2018	\$7,762.76		\$4,392.00	1st: Ream 34" hole from 245' to 251'. 2nd: 34" from 251' to 261' (16' @ DT ream rate)	377	261	

6/18/2018	\$7,762.76		\$7,018.00	1st: 34" 261'-278', 2nd: 34" 278'-290' <b>(29' @ DT ream rate)</b>	377	290
6/19/2018	\$7,762.76		\$4,796.00	1st: Ream 34" hole from 290' to 301', 2nd: 34" hole from 301' to 308' <b>(18' @ DT ream rate)</b>	377	308
6/20/2018	\$7,762.76		\$3,382.00	1st: Ream 34" hole from 308' to 313 feet. 2nd: Con't 34" hole from 313' to 319' <b>(11' @ DT ream rate)</b>	377	319
6/21/2018	\$7,762.76		\$1,160.00	1st: 34" 319-320, Trip out 34" reamer. Pulling weight so have to work up and down to get tools out of hole. Tag bottom of hole @ 296'. Tag water @ 184'. Refill Adler and Mud Tank. Clean off reamer assembly. Attempt to fill hole with water, not filling up so monitor water levels. Work on new mixing and flocculant tank. 2nd: Tally/run trimmie to 280' set up pumps and hoses for cementing. Mix and pump 26 yards of cement. <b>(17 pallets)</b> Pull trimmie and clean tools, pumps and hoses of cement While waiting for cement to cure, make modifications to mud cleaning system and organize site. Tagged cement @ 168' 9PM Introduce approximately 15' of water down hole Tagged cement @ 168' 11PM water at 98'	377	319
6/22/2018	\$7,762.76		\$1,160.00	Centerpunched cement and ran in 17.5" to drill pilot hole through cement. Drilled 17.5" to 209'	377	319 x
6/23/2018	\$7,762.76		\$1,160.00	1st: Drilled 17.5" thru cement from 209 to 253 ft. 2nd: 17.5" to 280' (didn't want to poke out of cement - drilling flooded) and tripped out and ran in 34" reamer. Reamed from 169 to 186 feet.	377	319 x
6/24/2018	\$7,762.76		\$1,160.00	1st: Reamed 34" from 186 to 213 feet. 2nd: Reamed 34" 213 to 244 feet.	377	319 x
6/25/2018	\$7,762.76		\$1,160.00	1st: Reamed from 244 to 259. 2nd Reamed 34" 259 to 274 feet.	377	319 x
6/26/2018	\$7,762.76		\$1,160.00	1st: Reamed 34" from 274 to 286 feet. (still flooded drilling cement)	377	319 x
6/27/2018	\$7,762.76		\$1,160.00	1st: Reamed 34" out of cement and lost circulation at 298 feet. (should this be 289 feet?) Tripped in tooling to cement hole 2nd: Cemented hole from 312 to 265 feet. Wait for cement to cure	377	319 x
6/28/2018	\$7,762.76		\$1,160.00	1st: 34" Ream cement from 265 to 282. 2nd: 34" ream cement 282 to 293 feet.	377	319 x
6/29/2018	\$7,762.76		\$1,160.00	1st: Ream 34" 293 to 301 feet and lost circulation. Tripped out and started to convert to DUAL TUBE REVERSE w/ AIR. 2nd: Continued conversion and started tripping in 17.5" DTRC	377	319 x
6/30/2018	\$7,762.76		\$1,160.00	1st: Drill 17.5" DTRC from 268 to 315' flooding back side to help circulate. 2nd: Drill 17.5" DTRC 315 to 339 feet. Continue to flood backside & drill, lose circulation, flood back side & drill, and repeat to advance hole.	377	319 x
7/1/2018	\$7,762.76		\$1,160.00	1st: Drill 17.5" DTRC from 339 to 374 feet. Trip out to go in with 34" to "dry ream" 2nd: Continued to torch off rotating head from conductor and tripped in 34" reamer	377	319 x
7/2/2018	\$7,762.76	\$45,024.98	\$4,796.00	1st: Dry ream 34" from 330 to 337' Is this 303feet? <b>(36' @ DT ream 301 to 337 feet)</b> Hit fill and couldn't advance. Tripped out to go back in with 17.5" to advance pilot hole deeper to allow us to dry ream deeper. 2nd: Weld rotating head back on and trip in 17.5" to clean out hole DTRC.	377	337
7/3/2018	\$7,762.76		\$2,414.00	1st: drill out fill with 17.5" bit from 337 to 379 feet. 2nd: clean fill 379 to 383' <b>(6' @ DT pilot rate)</b> and circulate multiple time ensure hole is clean. Trip out, cut off rotating head, and trip in 34" reamer to dry ream some more.	383	337
7/4/2018	\$7,762.76		\$4,713.00	1st: finish tripping in 34" reamer and dry ream from 337' to 354' and hit fill. <b>(17' @ DT ream)</b> Trip out for cement 2nd: Continued to trip out 34" reamer and set up to cement to top of fill at 348' Cemented	383	354
7/5/2018	\$7,762.76		\$1,160.00	1st: Let cement set. Tagged cement at 300' added water for 45 minutes and it did not come up. Set up to cement 2nd: Get ready to drill flooded reverse as cement set up. Tagged cement at 293 feet.	383	354



7/6/2018	\$7,762.76		\$1,160.00	1st: Adding water and monitoring for losses. Water came up to 94 feet. Started tripping in reamer but hole was taking water to tripped out and ran in tubing for more cement and cemented. 2nd: Tagged cement at 273 feet. Hole still not filling with water	383	354	
7/7/2018	\$7,762.76		\$1,160.00	1st: Waited for orders on how to proceed. 7:30 am set up to cement and pumped 275 more bags of cement. 2nd: Monitor cement, ran to town to get <b>4 pallets</b> of cement. Tagged cement at 207' and attempted to fill hole with no luck.	383	354	
7/8/2018	\$7,762.76		\$1,160.00	1st: Tag cement at 207' and pumped 240 bags of cement. 2nd: <b>Drive to Santa Fe to get 6 more pallets of cement</b>	383	354	
7/9/2018	\$7,762.76		\$1,160.00	1st: Tag cement at 156' and water level at 151. Added water and still not holding. Set tubing on bottom and pumped 270 bags cement. 2nd: Drove to Santa Fe to get more 6 more pallets of cement. Tag water at 94' and cement at 99 feet.	383	354	
7/10/2018	\$7,762.76		\$1,160.00	1st: tag water at 94 feet. Flood hole and hole is holding with some losses. Pump 60 more bags 2nd: Monitoring cement tag ever 30 to 60 minutes.	383	354	
7/11/2018	\$7,762.76	\$122,488.20	\$1,160.00	1st: Tag cement at 86' and water at 84'. Flood hole and hole is sealed. Center punch with 34" reamer and trip it out and go in with 17.5" flooded reverse. Drill 17.5" from 88 to 102 feet. 2nd: <b>Drill 102 to 140.</b>	383	354	
7/12/2018	\$7,762.76		\$1,160.00	1st: Drill 17.5" from 140 to 189 feet. 2nd: Drill 17.5" from 189' to 233'	383	354	
7/13/2018	\$7,762.76		\$1,160.00	1st: Drill 17.5" from 233' to 277 feet 2nd: Drill 17.5" from 178 to 321 feet (lost circulation in the process of drilling at 306')	383	354	
7/14/2018	\$7,762.76		\$2,420.00	1st: Drill 17.5" hole through cement from 322 to 340 feet. Conditioning LCM work on unplugging desanders. Drill 17.5" from 340 to 342 feet. 2nd: Drill 343 to 401 feet <b>(18' at Flooded Reverse Pilot Rate \$70/ft) Previous pilot depth 383' to 401'</b>	401	354	
7/15/2018	\$7,762.76		\$6,690.00	1st: Drill 17.5" pilot hole 401' to 433' 2nd: Drill 17.5" from 433 to 480 feet <b>(79' at Flooded Reverse Pilot Rate \$70/ft)</b>	480	354	
7/16/2018	\$7,762.76		\$7,670.00	1st: Drill 17.5" from 480 to 510 feet. 2nd: Drill 17.5" from 510' to 573 feet. <b>(93' at FRP Rate)</b>	573	354	
7/17/2018	\$7,762.76		\$5,780.00	1st: Drill 17.5" from 573 to 603 2nd: Drill 17.5" from 603 to 639 feet <b>(66' at FRP Rate)</b>	639	354	
7/18/2018	\$7,762.76		\$5,430.00	1st: Drill 17.5" from 639 to 669 feet 2nd: 669 to 700 feet <b>(61' at FRP rate)</b>	700	354	
7/19/2018	\$7,762.76		\$3,960.00	1st: Drill 17.5" from 692 to 725 feet 2nd: Drill 17.5" from 725 - 741 feet. Hole using fluid at 740 feet. Stabilize with LCM. <b>(40' at FRP rate - 700 to 742)</b>	741	354	
7/20/2018	\$7,762.76		\$1,160.00	1st: Trip out bit and roller stabilizer to check bit due to slower penetration. Trip back in and circulate. Start drilling at 741 feet. 2nd: Drill 17.5" from 741 to 749 feet. Hole using fluids. Stop fluid loss twice with LCM. Pull tools and run logs.	749	354	
7/21/2018	\$7,762.76		\$1,160.00	1st: Logger's onsite to run logs. Trip in 34" reamer to ream cement. Ream from 86' to 102 feet. 2nd: Ream from 102 to 121'	749	354	x
7/22/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 121 to 140. 2nd: Ream 34" from 140 to 161 feet	749	354	x
7/23/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 161 to 175 2nd: 175 to 190'	749	354	x
7/24/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 190 to 196 2nd: Service Clutch	749	354	
7/25/2018	\$7,762.76		\$1,160.00	1st Waiting on clutch 2nd: Waiting on clutch	749	354	
7/26/2018	\$7,762.76		\$1,160.00	1st: waiting on cluth 2nd: Ream 34" from 196 to 205 feet.	749	354	
7/27/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 205' to 220' 2nd: Ream from 220' to 248 feet.	749	354	
7/28/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 248 to 273 feet. 2nd: Ream 273 to 302 feet	749	354	
7/29/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 302 to 325' 2nd: Ream from 325 to 346 feet	749	354	
7/30/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 346 to 362 feet 2nd: Ream from 362 to 379 feet.	749	379	



7/31/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 379 to 398 feet. 2nd: Ream from 398 to 419 feet	749	419
8/1/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 419 to 445 feet. 2nd: Ream from 445' to 473 feet	749	473
8/2/2018	\$7,762.76		\$1,160.00	1st: Ream 34" from 473 to 502 feet 2nd: Ream from 502 to 535 feet	749	535
8/3/2018			\$0.00	1st: Ream 34" from 535 to 571 feet 2nd: Ream from 571 to 604 feet	749	604
8/4/2018			\$0.00	1st: Ream 34" from 604 to 639 feet. 2nd: Ream from 639 to 689 feet	749	689
8/5/2018			\$0.00	1st Ream 34" from 689 to 711 feet ( <b>TOTAL DEPTH for running 28" casing</b> ) 2nd: Circulate fluids and wait on loggers for caliper log	749	711
8/6/2018			\$0.00	1st: Run in 34" bit to clean out clobbered mud 2nd: Continued cleaning hole and fluids	749	711
8/7/2018			\$0.00	1st: Run in 34" bit to clean out clobbered mud 2nd: Continued cleaning hole and fluids	749	711
8/8/2018			\$0.00	1st: finished condition fluids and hole cleaning. Successfully ran caliper log and set up to run casing 2nd: Welded in 28" casing to 640 feet	749	711
8/9/2018			\$0.00	1st: Finished running 28" casing to 700 feet. Welded on cementing head and pressure grouted casing (Basic Energy - cementers) from bottom of casing up to surface. 2nd: Remove cementing head, make up 26" reamer, cut down surface casing and weld in flow line to 28" casing	749	711
	\$80,335.05			See back up documentation attached.	Pilot	Ream
Drilling Additives	\$1,042,917.29	\$335,512.67	\$264,813.00			
<b>TOTALS</b>	<b>Cost</b>	<b>Change Order Rev</b>	<b>Approved Rev</b>			

**Drilling Additive Tally - (Invoices attached)**

April 1 through June 23	2M Invoice 1/15/18 \$6731.68
Total Cost	2M Invoice 1/18/18 \$1565.92
\$1,042,917.29	2M Invoice 1/18/18 \$767.04
	2M Invoice 4/03/18 \$1287.44
	2M Invoice 4/18/18 \$3066.52
Deduct for April 24 & May 22, 23, 24, 25, 26, 27	2M Invoice 4/27/18 \$4449.50
\$54,339.32	2M Invoice 5/21/18 \$3264.00
	Hole Products Invoice 6/7/18 \$9592.66
Cost Less Days Deducted	2M Invoice 6/21/18 \$34,014.36
\$988,577.97	2M Invoice 6/25/18 \$2040.00
	2M Invoice 7/10/18 \$2731.25
Layne Billings Less Cost (profit)	Hole Products Invoice 7/19/18 \$14,923.44
-\$388,252.31	
	<b>Total: \$84,433.81</b>

**Page 3 of 3**

Requested by Project Manager: \_\_\_\_\_  
James Alarid PE Date

Approved by County/Owner: \_\_\_\_\_  
Timothy A Glasco PE, Utilities Manager Date

Approved by the County Council on the 25th day of September, 2018.

**COUNCIL OF THE INCORPORATED  
COUNTY OF LOS ALAMOS**

\_\_\_\_\_  
**David Izraelevitz, Council Chair**

**ACCEPTANCE OF CHANGE ORDER**

(Contractor name)

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

Print Name \_\_\_\_\_

Title \_\_\_\_\_

(Corporate Seal)

Attest:

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

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