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08/31/2009 02:16 PM Deputy: DW
OFFICIAL RECORD
Requested By:
DC/PUBLIC WORKS

Douglas County - NV
Karen Ellison - Recorder
Page: 1 Of 8 Fee: 0.00
BK-0809 PG- 7711 RPTT: 0.00

Assessor's Parcel Number: N/A

Date: AUGUST 31, 2009

Recording Requested By:

✓ **Name:** EILEEN CHURCH, PUBLIC WORKS

Address:

City/State/Zip:

Real Property Transfer Tax: $ N/A

CONTRACT AMENDMENT #2009.244

(Title of Document)

This page added to provide additional information required by NRS 111.312 Sections 1-2. (Additional recording fee applies)
This cover page must be typed or legibly hand printed.

0749940 Page: 2 Of 8 BK- 0809 PG- 7712 08/31/2009

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NO. 2009.244
2009 AUG 28 PM 3:47
TED THRAN
CLERK
DEPUTY

AMENDMENT NO. 01

A Contract between Douglas County

and

Carson Pump LLC

for

Redevelop and Rehabilitate a Simek Well

WITNESSED

WHEREAS, on June 22, 2009, Douglas County, a political subdivision of the State of Nevada ("COUNTY"), and Carson Pump LLC, an independent contractor ("CONTRACTOR"), entered into a contract for certain services; and

WHEREAS, the County desires to amend the contract; and

NOW, THEREFORE, in consideration of the agreements herein made, the parties mutually agree as follows:

1. Amend the scope of work as per attached letter from ECO:LOGIC to Jerry Walker, dated July 28, 2009, and increase the contract amount by $12,395.00.

2. All sections of the original agreement remain in effect.

Independent Contractor — Date 8/5/09

County Manager — Date 8/18/09

Attest:

County Clerk — Date 8-28-09

DEPUTY CLERK

ECO:LOGIC
ENGINEERS · CONSULTANTS
10381 Double R Boulevard
Reno, NV 89521
775.827.2311 TEL
775.827.2316 FAX

July 28, 2009

Jerry Walker
Utilities Superintendent
Douglas County Utilities Division
P.O. Box 218
Minden, NV 89423

DOUG09-002

RE: Montaña Blue Sky Well testing results

Dear Jerry:

A summary of the July 21, 2009 test of the "Blue Sky" well at the Montaña subdivision in Douglas County is provided for your review. The test pump and ancillary equipment were provided by Carson Pump. ECO:LOGIC orchestrated the test and provided an In-Situ, Inc. LevelTROLL pressure transducer/data logger to measure and record water levels during the test and the ensuing recovery period.

The test comprised three steps of three hours (180 minutes) duration each, for a total of nine hours (540 minutes) of testing. The drawdown data from the test are illustrated in Figure 1 and the results are summarized in Table1.

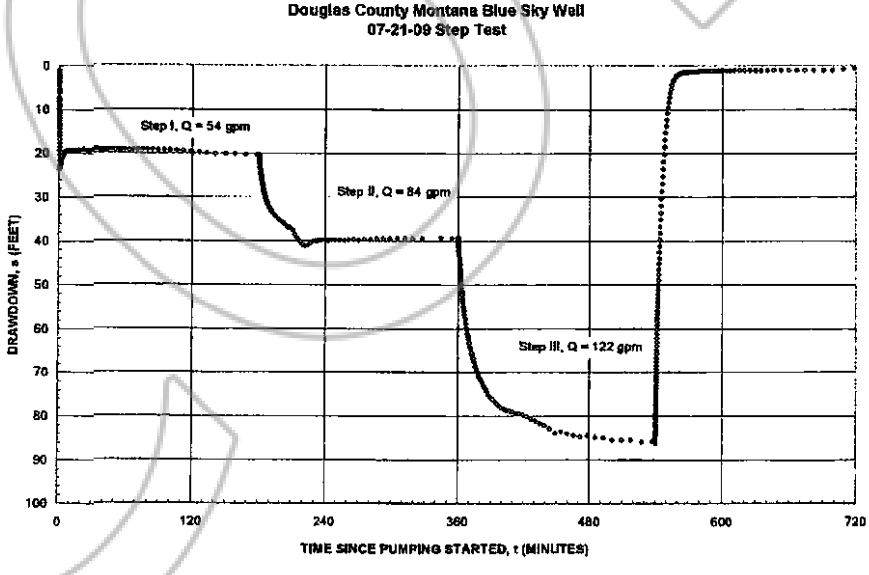

Figure 1. Drawdown Data for July 21, 2009 Test of the Montaña Blue Sky Well.

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Table 1. Summary of July 21, 2009 Test of the Montaña Blue Sky Well.

Step	Duration t (minutes)	Pumping rate Q (gpm)	Pumping level (feet)	Drawdown s (feet)	Specific Capacity C_s (gpm/ft)
I	60	54	109.46	20.81	2.595
II	60	84	128.48	39.83	2.109
III	60	122	174.60	85.95	1.419

The drawdown data for Steps I and II, illustrated in Figure 1, provide some insight into the well's behavior. In particular, note that the slope of the drawdown plot for the first two hours of Step I is nearly flat or "zero" for the first two hours of the test. For Step II, the drawdown actually decreased slightly (pumping level rose), even though the pumping rates for each step were held as constant as practicable (within about ½ gpm). The suggestion is that the transmissivity of the aquifer is significantly higher than the specific capacity data indicate and that the well may have been developing as testing progressed. That the well might have been developing is further indicated by the discharge becoming cloudy at the start of the third step.

The specific capacity data listed in Table 1 are also illustrative. They show a very large decline in specific capacity with increased pumping rate, which is indicative of low overall well efficiency. The efficiency of the well ranges from a high of approximately 30% for Step I to a low of 16% for Step III. We typically see efficiencies greater than 80% for wells completed in alluvial deposits. One possible cause of the poor well performance is formation damage associated with loss of circulation during the drilling of the well and plugging of the formation with drilling fluid. The well was completed with 100-slot well screen and a coarse gravel pack, which suggests coarse formation materials are present at this locale. Coarse formation materials and a depth to water of approximately 90 feet might well combine to cause significant lost circulation during the well-drilling operations. However, in the absence of daily reports prepared by the driller, our conclusions are speculative.

Based on the recent test results, it appears as if the well can be rated to yield approximately 120 to 125 gallons per minute and maintain a pumping level above the top of the well screen (top of well screen is 200 feet below land surface) in its current state. However, the low well efficiency suggests the well has the potential to yield significantly more water, if the cause of the inefficiency can be remedied. For example, given a specific capacity of 20.81 gpm/ft and 110 feet of available drawdown, a highly efficient well has the potential to yield more than 200 gallons per minute.

Because there is a potential for the well to yield approximately 200 gpm, we are recommending additional development using a program that targets residual drilling fluids outside the well bore.

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We have discussed this idea with Dan Trampe of Carson Pump and he aggress that the well performance might benefit from additional development. Specifically, we recommend:

1. Install a polymer drilling-fluid dispersant, such as MW-220, in the well, followed by line swabbing.
2. Add an additional volume of MW-220 solution, followed by more line swabbing.
3. Repeat step 2, if necessary.
4. Pump the well at the maximum practical pumping rate to remove the residual chemicals and any residual drilling fluids that might have been present.
5. Perform a short (3-hour duration) step test to evaluate the results.

The program outlined above is designed to distribute the dispersant progressively farther out into the formation.

Once the development work has been completed, ECO:LOGIC will orchestrate the step test to be performed by Carson Pump to evaluate the results of the development program. ECO:LOGIC will also provide a brief letter report that documents the work, summarizes the results, and provides recommendations for the selection of a production pump to be installed in the well.

The opinion of probable cost for the program, including the work by Carson Pump (see attachment) and our participation in the testing, analysis, and reporting following the development program is summarized in Table 2. The combined total for this effort is $16,895. It is our understanding that the County will contract directly with Carson Pump for their participation in the program.

Table 2. Summary of Opinion of Probable Cost for Additional Development of the Montaña Blue Sky Well.

	Carson Pump [a]	ECO:LOGIC [b]
Well Development	$11,570	Not applicable
Testing	$825	$4,500
Subtotals	$12,395	$4,500
Notes:	a. See attached quote from Carson Pump. b. Orchestrate short step test, provide data analysis and brief letter report.	

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Thank you for the opportunity to assist you with this project. If you have any questions or require any further information, please do not hesitate to contact me.

Sincerely,
ECO:LOGIC

Dale C. Bugenig
Chief Hydrogeologist

attachment

CARSON Pump LLC
P.O. Box 20159
Carson City, NV
89721-0159

Estimate

Date	Estimate #
7/24/2009	Big Sky We

Name / Address
Mr. Jerry Walker Douglas County Utilites P.O. Box 218 Minden, NV 89423

Project

Description	Qty	Cost	Total
Mobilization and Demobilization	1	900.00	900.00
Furnish 6 gallons of Johnson NW-220 mud dispersant	6	125.00	750.00
Install tremme pipe to 200, mix and inject NW-220 into screens, est. 8 hrs	8	240.00	1,920.00
Line swab screens for 12 hours	12	240.00	2,880.00
Install development tool to 260'	260	7.00	1,820.00
Pump and swab screens to redevelope	12	275.00	3,300.00
Testing DVB 07/23/09	3	2,750.00	8,250.00

Thank you for considering Carson Pump for this proposal

Subtotal	~~$11,570.00~~ 12,395.00
Sales Tax (7.1%)	$0.00
Total	~~$11,570.00~~ 12,395.00

COPY

CERTIFIED COPY

The document to which this certificate is attached is a full, true and correct copy of the original on file and on record in my office.

DATE: Aug 31, 2009

~~TRACY~~ Clerk of the 9th Judicial District Court of the State of Nevada, in and for the County of Douglas.

By _____ Deputy