

GASCO

A SUBSIDIARY OF

KM ENERGY



00260189

Gasco, Inc.
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P.O. Box 281304
Lakewood, CO 80228-8304
(303) 980-9340

October 24, 1994

Mr. Paul S. Osborne
United States Environmental Protection Agency
111 18th Street
Denver, CO 80202

RE: Gasco, Inc.'s Aquifer Exemption Request for the
Dakota Formation in the Canadian River Field.

Dear Mr. Osborne

Mr. Ed DiMatteo with the Colorado Oil and Gas Conservation Commission forwarded your letter Ref: 8WNM:DW, to Gasco, Inc. on September 28, 1994. I am responding to your comments and concerns raised in your letter. Some of your concerns were addressed in Gasco's original letter application for the proposed Disposal/Injection well sent to the State of Colorado on July 1, 1994, of which you may not have received a copy. I have attached a copy for your review.

One of your questions was: Why is this well needed immediately? This is a very important point that needs to be addressed so that we may move forward quickly with this review process. The Canadian River Field is the only natural gas source for the town of Walden, Colorado. At this time there are only three wells capable of producing gas in economical volumes. The field is being depleted by the existing wells, and these wells are beginning to have production problems because the water production is increasing as the gas production decreases.

Presently at current demand, the Blevins A-10 well produces enough gas to supply the town. We are keeping the State #1 and the Blevins A-1 shut in pending the demand for gas in Walden. At current rates, the A-10 makes about 20 barrels of water per day.

Both Gasco and the town of Walden are concerned that the town will lose it's natural gas supply during the cold winter months ahead. Drilling an additional well in the field will not alleviate the water production problems. The present wells are capable of supplying enough energy to the town, and a new well would have the same production problem with water the existing wells have.

Currently, we are having the produced water hauled to Conoco Inc.'s Pierre B waterflood (This is described in more detail below) but this is not a feasible long term solution to the water disposal problem in the Canadian River Field. The three producing wells are in areas that have only snowmobile access during the winter which will make getting a water hauling truck to the sites impossible once the snow makes the road impassible. Gasco intends to connect the source wells to the injection well with a water pipeline.

One thing to keep in mind also, is that it is important to keep the project economically viable. Making the Blevins A-2 gas well into a water injection facility is the most cost effective method keeping the town of Walden supplied with gas.

In response to item 1. in your letter:

Questions: What is the source of Produced water and what are the present producing zones? Which wells are involved in the production of oil or gas and water. Where is the water presently being taken for disposal and why is this well needed immediately?

The wells intended to be water source wells are all located in T9N, R78W. Please see attached plat, Exhibit 1:

<u>Well</u>	<u>Operator</u>	<u>Location</u>	<u>Formation</u>	<u>Prod from well</u>
Blevins A-1	Gasco, Inc.	NE NW Sec 11	Lakota	gas, water
Blevins A-10	Gasco, Inc.	NE NW Sec 11	Muddy	gas, water
State #1	Gasco, Inc.	SE SW Sec 2	Lakota	gas, water

Gasco does not intend to treat the disposal water prior to injection into the Blevins A-2 well.

This past summer the water was disposed into an on site pit, but as water production increased it became necessary to find another method of water disposal. Beginning in October, 1994, GASCO began trucking the produced water to Conoco "Pierre B" waterflood operated by Conoco Inc. This move was given verbal approval by Brian Macke, the Associate Director for the Colorado Oil and Gas Commission, Steve Miller with Conoco, and was acknowledged by Kirk Fleetwood With the Bureau of Land Management at the Little Snake River Resource Area in Craig, CO. Sundry notices for this disposal method to both the State of Colorado and the BLM have been approved. As discussed above, this disposal method is a short term solution at best.

The urgency of the situation was discussed above.

In response to item 2 of your letter:

Questions: The application indicated that the Dakota was oil producing but does not indicate whether the Dakota is still oil producing. The location of the historical producing zones in the field relative to the disposal zone in the Blevins A-2 should be described. Well completion Diagrams should be included.

There are 42 wells location in Sections 2, 3, 10, and 11, T9N, R78W. Of these wells, 22 are plugged and abandoned or shut in, and 20 are capable of producing though only the Blevins A-10, A-1 and State #1 are economical at this time. The Blevins A-2 Dakota well is one of the shut in wells that is no longer capable of producing oil in commercial quantities. Of the 20 wells capable of

producing, 17 produce oil from the Niobrara, but the Niobrara wells have not economically produced oil since May 1993 and the operator, Noffsinger Manufacturing eventually intends to plug and abandon the wells.

The only wells producing in Sections 2, 3, 10, and 11 are the Blevins A-10 and State #1 that produce gas from the Lakota and the Blevins A-10 that produces gas from the Muddy formation.

Exhibit 2 includes well completion diagrams for the shut in Blevins A-2 (one diagram for the current wellbore and one after conversion to the injection well), and the producing Blevins A-10, A-1, and State #1.

In response to item 3. in your letter:

Comment: Although there are no water wells in the immediate sections adjacent to the project, the exemption process would be enhanced if the area of review for water wells was expanded. I would suggest that a 6 to 10 mile radius be used. This will assist in identifying potential Pierre shale stringers which may be local water sources.

As you requested, Exhibit 3 shows water well locations as of October 17, 1994. The majority of the wells in the area are less than 150 feet deep. Since the proposed water injection well has a 12 1/2" cemented steel surface casing to a depth of 461 feet, and an 8 5/8" steel production casing protecting the zones around the well, the Pierre surface stringers that the local water wells produce from would be protected from contamination.

In response to item 4. in your letter:

Comment: Information on how the wells were sampled should be provided.

The wells were sampled by standard well sampling procedures. The produced well water was collected in a pint bottle and sent to a lab for analysis. Our tests were done by Century Refining Company in Brighton Colorado, and Dowell Schlumberger in Vernal Utah.

In response to item 5. in your letter:

Comment: The Dakota sample analysis seems to be in error. I question the bicarbonate analysis for the State #1 Dakota sample.

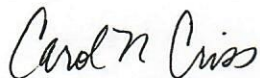
According to the lab analysis report for the State #1, the bicarbonate amount is correct, the 5.10 is not a typographical error. Exhibit 4 is a copy of the water analysis for the State #1. The produced water from the State #1 appears to be much fresher, that is lower in dissolved solids than the water from the Blevins A-1 or Blevins A-10.

I hope this letter has satisfied your concerns relating to the Aquifer exemption and Gasco's Injection well application. I am forwarding a copy of this letter to Mr. Ed DiMatteo at the Colorado Oil and Gas Conservation Commission and to Mr. George Moravec at the Colorado Department of Public Health and the Environment.

While I realize you wish to be thorough in your review process, I would like to request you give Gasco's request urgent priority. We would like to move forward on this project to ensure the town of Walden will not lose their gas supply because we are not able to properly dispose of the produced well water.

Sincerely,

Gasco, Inc.



Carol N. Criss

Enclosure

cc: George Moravec, CDPH&E
Ed DiMattio, COGCC

EXHIBIT 1

LEGEND

————— RMNG Pipeline System

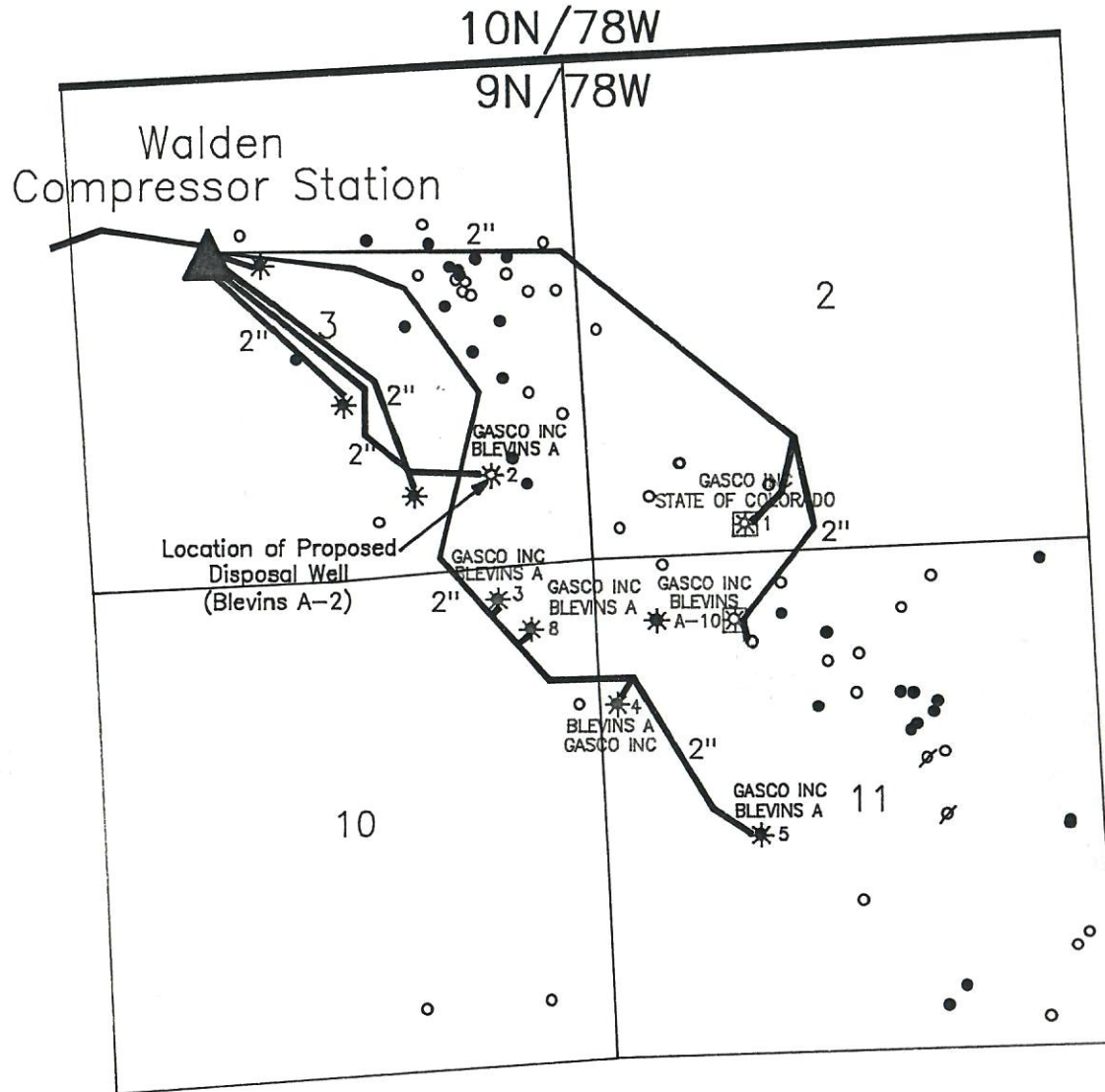
WELL LEGEND

- * Gas
- Oil
- * Oil & Gas
- ∅ Shut-in
- Abnd. Location
- ☒ Active Well

Note: All wells are currently inactive except for the State of Colo. #1, Blevins #A-10 & Blevins A #1.

COLOR PRODUCING FORMATION

- Red Lakota
- Blue Dakota
- Green Lakota and Dakota
- Muddy



K N GAS GATHERING, INC.

Gasco Wells
Canadian River Field
Jackson County, Colorado

Prep. by: SADavis

Rev: 20 Oct 1994

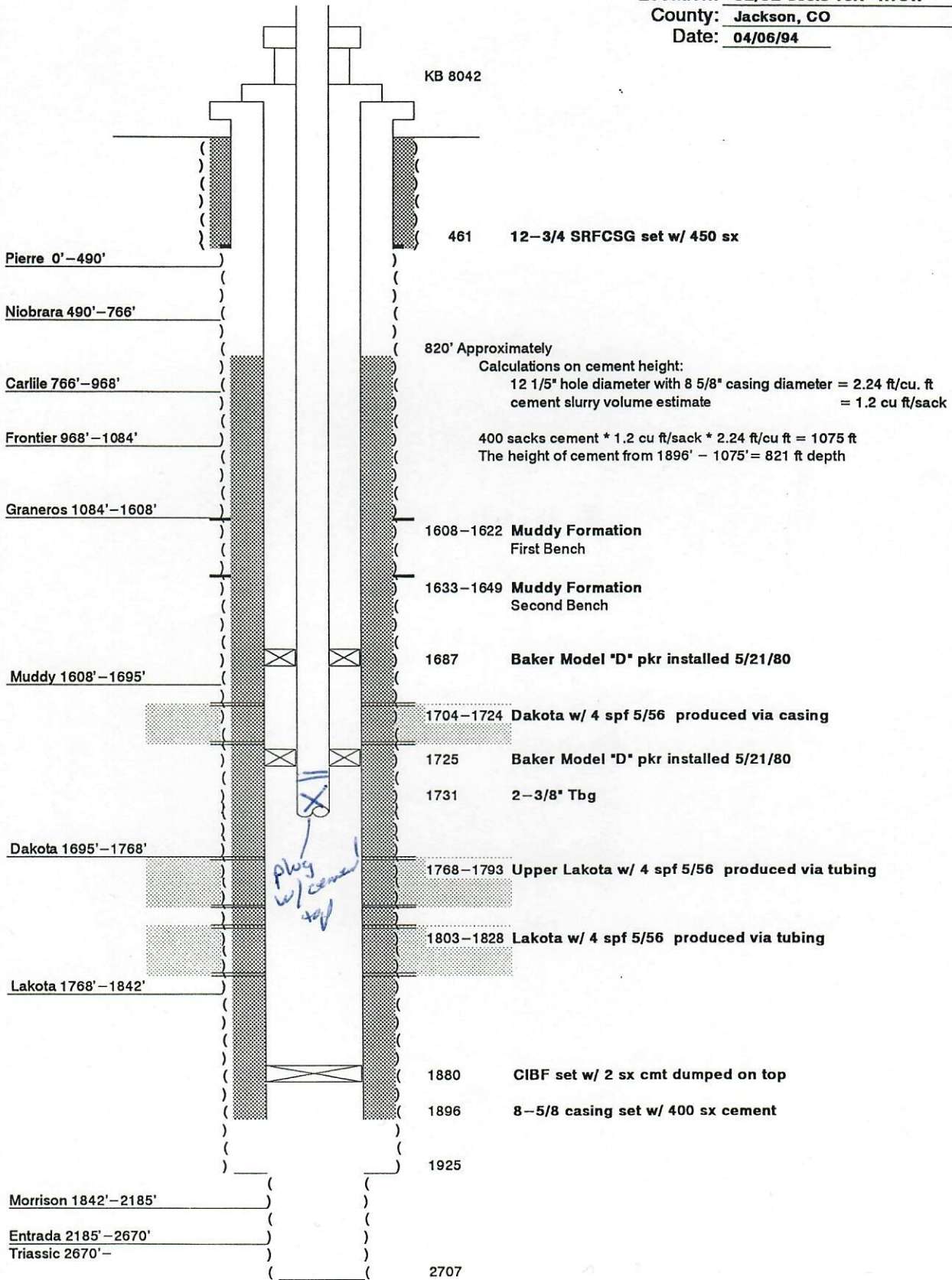
12 May 1994

Scale: 1"=2000'

File: canadian.gpf

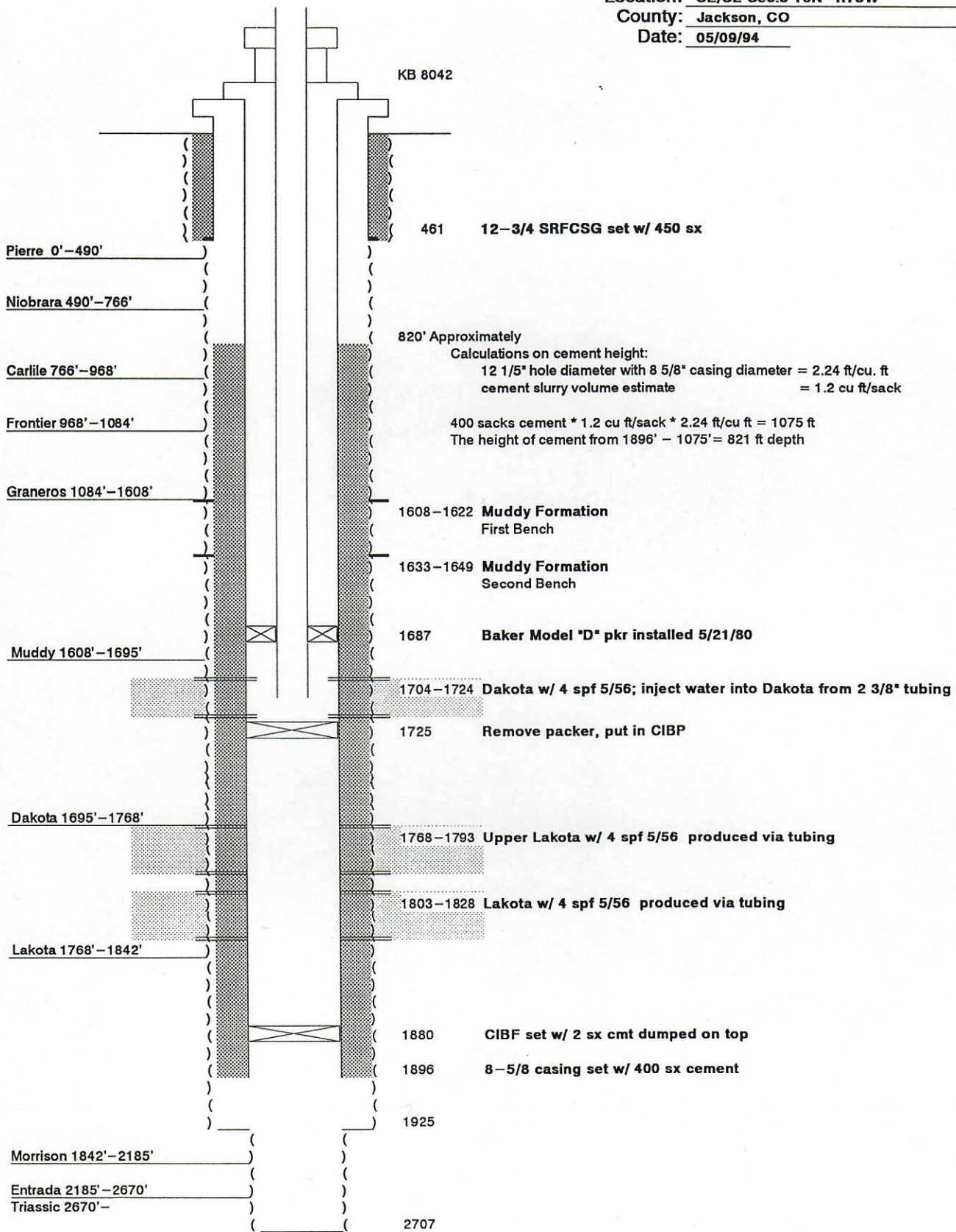
WELLBORE DIAGRAM
PRIOR TO CONVERSION TO INJECTION WELL

Company: GASCO, INC.
 Lease Name: Blevins
 Lease Number: A-2
 Location: SE/SE Sec.3 T9N-R78W
 County: Jackson, CO
 Date: 04/06/94



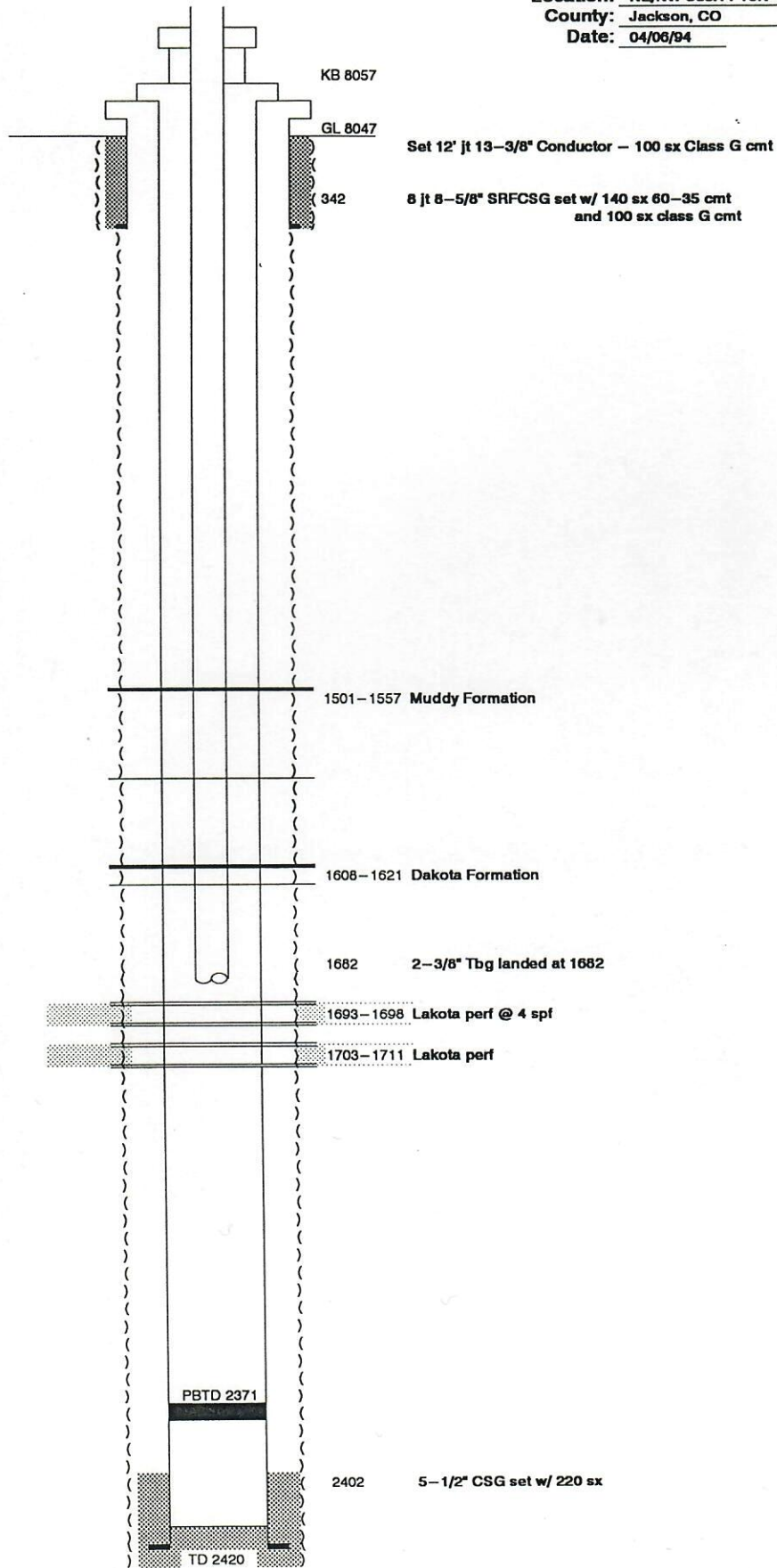
WELLBORE DIAGRAM
CONVERTED TO INJECTION WELL

Company: GASCO, INC.
 Lease Name: Blevins
 Lease Number: A-2
 Location: SE/SE Sec.3 T9N-R78W
 County: Jackson, CO
 Date: 05/09/94



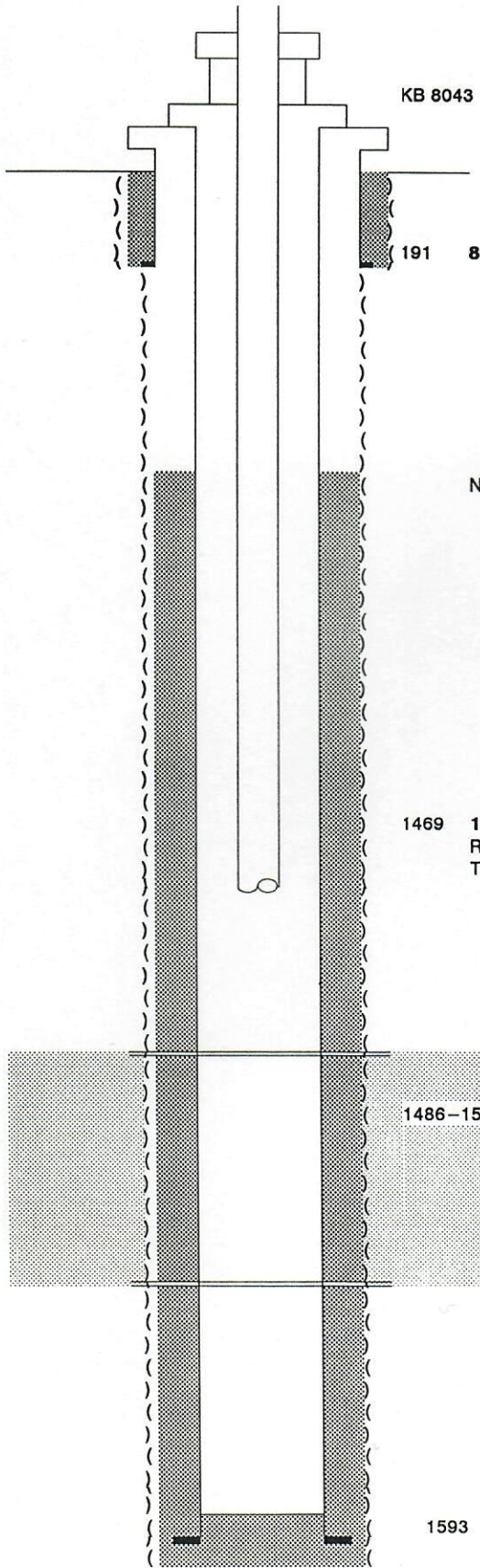
WELLBORE DIAGRAM

Company: GASCO, INC.
Lease Name: Blevins
Lease Number: A-10
Location: NE/NW Sec.11 T9N-R78W
County: Jackson, CO
Date: 04/08/94



WELLBORE DIAGRAM

Company: GASCO, INC.
Lease Name: Blevins
Lease Number: A-1
Location: SW/NW Sec.11 T9N-R78W
County: Jackson, CO
Date: 04/06/94



NOTE: Cemented drill pipe with 1000 sx, a volume of approximately 1200 ft³.
The annulus has a volume of only 430 ft³ indicating fracture.

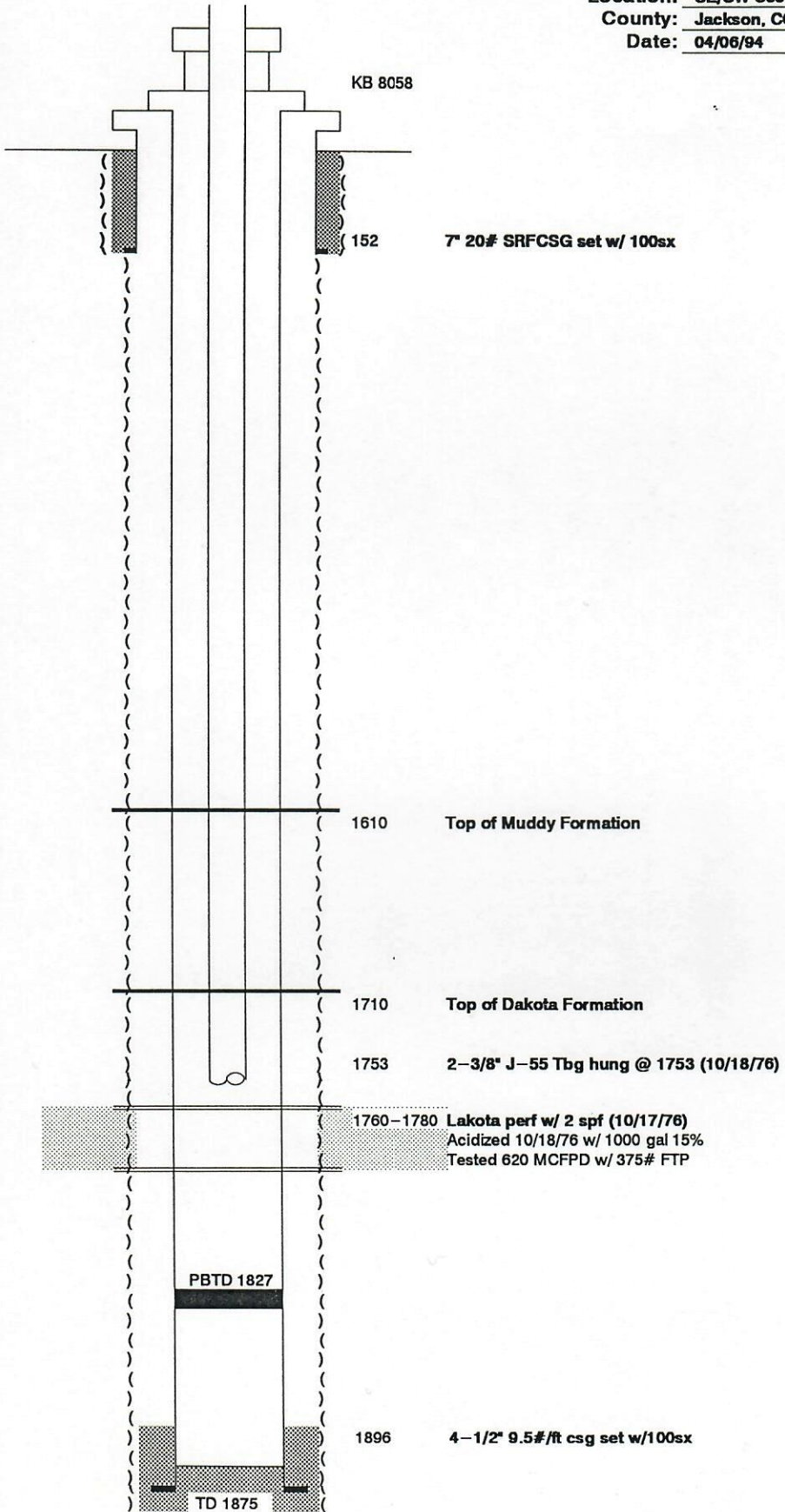
1469 1-1/4" Tbg (45 JTS) landed at 1469 KB 05/17/80
Report 05/17/80 indicates that perms are covered
Tbg tagged bottom at 1487 KB

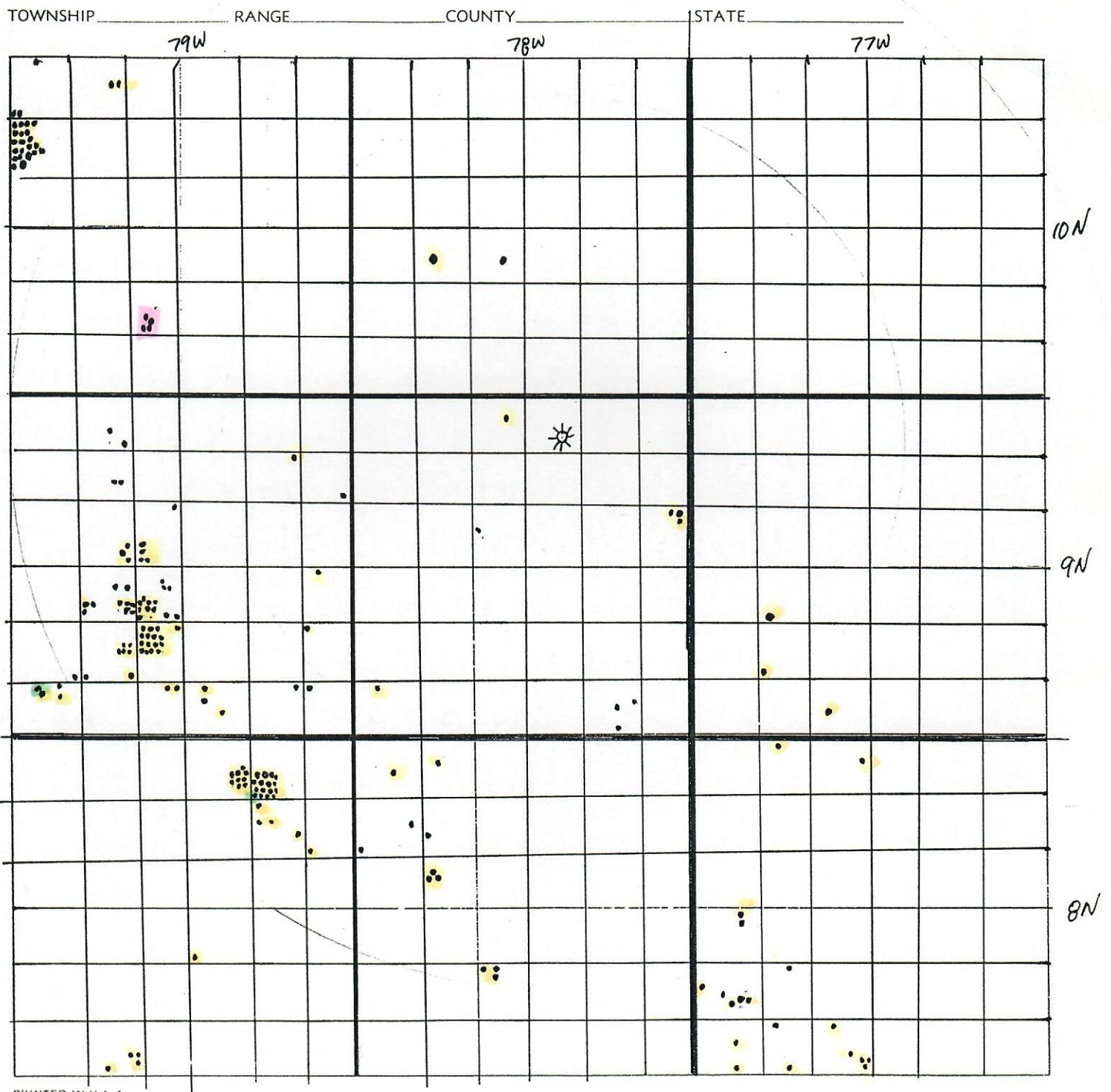
1486-1533 Muddy Formation
Perfs (total 190 holes)
Tested 2500 MCFD natural 4/56

1593 3-1/2" drill pipe 13.3# CSA 1590' cmt w/ 1000 sx

WELLBORE DIAGRAM

Company: GASCO, INC.
Lease Name: State
Lease Number: #1
Location: SE/SW Sec.2 T9N-R78W
County: Jackson, CO
Date: 04/06/94





PRINTED IN U. S. A.

- < 300'
- 300 > 400'
- > 3000'

Cenref Labs

Century Refining Company

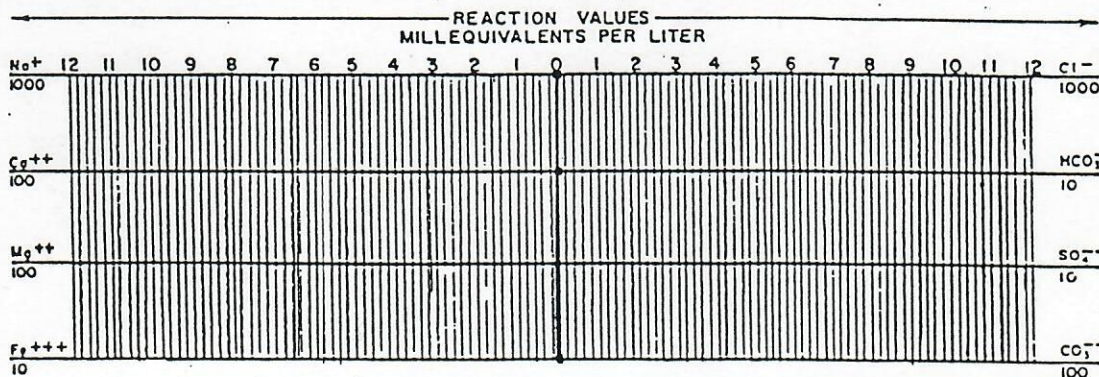
WATER ANALYSIS

Lab No. C86FW4451 Date Completed December 14, 1986
 Date Received November 24, 1986 Date Sampled _____
 Company KN Energy Well Name _____ State I
 Location _____ County _____ State _____
 Field _____ Formation _____ Depth _____ To _____
 Sampled From _____ Requested By Rick Wells Sampled By _____

PARAMETERS

Specific Gravity	<u>1.0028</u>	at	<u>60</u>	degrees F		
pH	<u>4.6</u>					
Water Resistivity	<u>12</u>	OHM-Meters at	<u>60</u>	degrees F		Reaction Value %
		<u>mg/l</u>	<u>ppm</u>	<u>me/l</u>		
*Sodium, Na (Calc.)	<u>119.79</u>	<u>119.45</u>	<u>5.21</u>	<u>31.37</u>		
Calcium, Ca	<u>50.00</u>	<u>49.86</u>	<u>2.50</u>	<u>15.02</u>		
Magnesium, Mg	<u>7.30</u>	<u>7.28</u>	<u>0.60</u>	<u>3.61</u>		
Chloride, Cl	<u>290.00</u>	<u>289.19</u>	<u>8.18</u>	<u>49.25</u>		
Carbonate, CO ₃	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>		
Bicarbonate, HCO ₃	<u>5.10</u>	<u>5.09</u>	<u>0.08</u>	<u>0.50</u>		
Sulfate, SO ₄	<u>2.00</u>	<u>1.99</u>	<u>0.04</u>	<u>0.25</u>		
Hydroxide, OH	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>		
Total Dissolved Solids (Calc.)	<u>474.19</u>	<u>472.86</u>	<u>16.61</u>	<u>100.00</u>		
Primary Salinity	<u>62.72</u>	% Total Reaction Value				
Secondary Salinity	<u>36.27</u>	% Total Reaction Value				
Primary Alkalinity	<u>0.00</u>	% Total Reaction Value				
Secondary Alkalinity	<u>1.01</u>	% Total Reaction Value				
CaCl ₂ /Mg Cl ₂	<u>4.84</u>					

*Includes all cations other than Calcium and Magnesium.



CENREF PROJECT NO. PR861091

Cenref Labs

Century Refining Company

WATER ANALYSIS

Lab No. C87FW0355
 Date Received January 22, 1987

Date Completed January 26, 1987
 Date Sampled _____

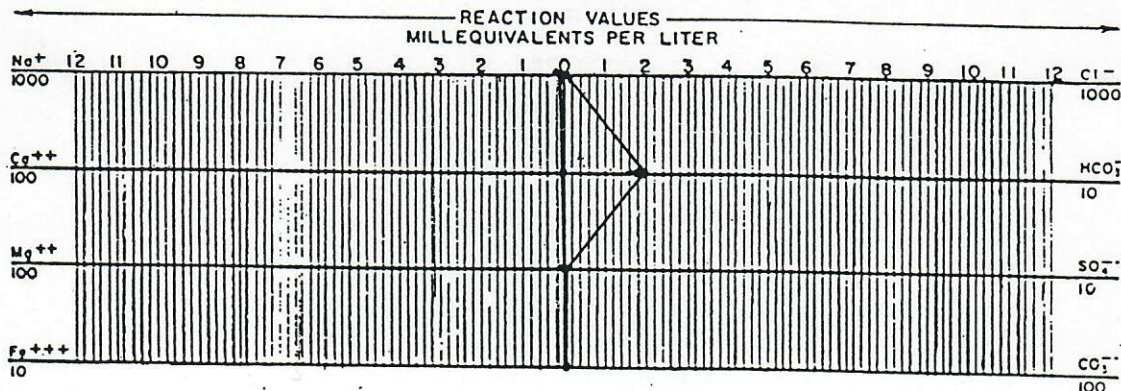
Company K N Energy Well Name Blevins A1
 Location _____ County _____ State _____
 Field _____ Formation _____ Depth _____ To _____
 Sampled From _____ Requested By Rick Wells Sampled By _____

PARAMETERS

Specific Gravity 1.0030 at 60 degrees F
 pH 8.5
 Water Resistivity 2.8 OHM-Meters at 60 degrees F

	mg/l	ppm	me/l	Reaction Value %
*Sodium, Na (Calc.)	1100.70	1097.40	47.88	49.49
Calcium, Ca	5.60	5.58	0.28	0.29
Magnesium, Mg	2.60	2.59	0.21	0.22
Chloride, Cl	960.00	957.10	27.08	28.00
Carbonate, CO ₃	44.00	43.87	1.47	1.50
Bicarbonate, HCO ₃	1200.00	1196.40	19.67	20.35
Sulfate, SO ₄	7.00	6.98	0.15	0.15
Hydroxide, OH	0.00	0.00	0.00	0.00
Total Dissolved Solids (Calc.)	3319.90	3309.92	96.74	100.00
Primary Salinity	56.29			% Total Reaction Value
Secondary Salinity	0.00			% Total Reaction Value
Primary Alkalinity	42.69			% Total Reaction Value
Secondary Alkalinity	1.02			% Total Reaction Value
CaCl ₂ /Mg Cl ₂	1.52			

*Includes all cations other than Calcium and Magnesium



CENREF PROJECT NO.
 PR870081

Schlumberger Logwell

API WATER ANALYSIS REPORT FORM

Laboratory Location: Vernal UT

DATE: 5-23-91

LAB NO. _____

COMPANY: <u>Caso</u>		SAMPLE NUMBER	DATE <u>5-19-94</u>
FIELD <u>Can River</u>	LEGAL DESC.	COUNTY/PARISH	STATE
LEASE UNIT	'WELL <u>A 10</u>	DEPTH	FORM.
TYPE WATER (PROD, SUPP. ETC.)		Sampling point	'WATER, B/D
			SAMPLED BY <u>[Signature]</u>

DISSOLVED SOLIDS

CATIONS	mg/L	me/L
Sodium, Na (acl)	<u>270</u>	<u>11.6</u>
Calcium, Ca	<u>160</u>	<u>8</u>
Magnesium, Mg	<u>480</u>	<u>38.4</u>
Barium, Ba	_____	_____
_____	_____	_____
_____	_____	_____

OTHER PROPERTIES

pH	<u>8</u>
Specific Gravity, 60/60 F.	<u>0.98</u>
Resistivity (ohm-meters)	<u>F.</u>
_____	_____
_____	_____
_____	_____

ANIONS

Chloride, Cl	<u>800</u>	<u>22.4</u>
Sulfate, SO ₄	<u>2</u>	<u>0.04</u>
Carbonate, CO ₃	<u>-</u>	<u>-</u>
Bicarbonate, HCO ₃	<u>2200</u>	<u>35.2</u>
_____	_____	_____
_____	_____	_____

Total Dissolved Solids (calc.)

Iron, Fe (tot.)

1

Sulfide, as H₂S

REMARKS AND RECOMMENDATIONS:

