Unocal North American
Oil & Gas Division
Unocal Corporation
1004 North Big Spring, P.O. Box 671
Midland, Texas 79702
Telephone (915) 682-9731

UNOCAL 76

April 21, 1992

Southwestern Region
Andrews District

Mr. Ben Stone
New Mexico Oil Conservation District

As per our conversation on April 20, 1992 regarding wells in the area of review of the State 35 #6 Injection Permit Application, the following information should answer most questions:

State 35 #1 - An incomplete cement volume was quoted. 500 sxs were pumped around the casing shoe and an additional 345 sxs were pumped through the DV tool set @ 4373'. Fill up calculations are presented in the attachments.

State 35 #2 - Again, an incomplete cement volume was quoted. 300 sxs were pumped around the shoe with an additional 300 sxs pumped through the DV tool set @ 4073'. Fill up calculations are presented in the attachments.

Watt A #9 - Have discovered well was plugged back to the Grayburg formation in 1988. The casing was squeezed between 5283'-5862' w/ 70 sxs cement. The new plug back depth is 4805'. Fill up calculations are presented in the attachments.

Lea-State "KG" #1 - A 7-7/8" hole was drilled out from under the 8-5/8" casing set at 3255'. The 7" casing set at 6930' was cemented with 150 sxs of regular cement. Due to the close tolerance between casing and hole, top of cement in this string should be at 4437'. The 7" was drilled out w/ a 6-1/4" bit. A 4-1/2" liner was hung between 6812' and 8869'. It was cemented w/ 285 sxs regular cement which yields 3277' of fill up, more than enough to completely cover the liner.

Fill up calculations are presented in the attachments.

I trust this information will answer the questions you had concerning offset well integrity. If there is still a problem with the construction of these offset well bores, please call and lets discuss what options Unocal might have.

Sincerely,

Union Oil Company of California
dba UNOCAL

Greg Fitzgerald
Sr. Petroleum Engineer

Calculation Record

Union 76

Prepared by	Checked by	Date	Sheet
G Fitzgerald		4/21/92	of

Title: State 35 #1 Well

W.O. / A.F.E. no.:

Drill 7⅞" hole

Top Cmt 2nd Stage 1827 ft

5½ Csg

Volume Short 5½ x hole = 5.7719 ft³/ft

92 sx 50/50 Pozmix
Yield = 1.26 ft³/sx
Fillup = 662 ft

120 sx Regular Cmt
Yield = 1.18 ft³/sx
Fillup = 817 ft

134 sx Regular Cmt w/ 4% gel
Yield = 1.38 ft³/sx
Fillup = 1067 ft

DV Tool @ 4373'

Top Cmt 1st Stage 5205'

400 sx 50/50 Pozmix
Yield = 1.26 ft³/sx
Fill up = 2909 ft

100 sx Regular Cmt
Yield = 1.18 ft³/sx
Fillup = 681 ft

5½" Csg
@ 8295'

Calculation Record
Union Oil Company of California

UNION 76

Prepared by	Checked by	Date	Sheet
G. Hagerman		4/21/92	1

Title: State 35 #2 Well

W.O. / A.F.E. no.:

Drill 7 7/8" hole
4½" Csg
Volume Shoe 4½" Hole
= 4.3899 Ft/Ft³

Top Cmt 2nd Stage 2413 Ft

300 Sx 1-1 diamix
Yield = 1.26 Ft³/Sx
Fillup = 1659 Ft

DV Tool @ 4072

Top Cmt 1st Stage 7180'

200 Sx 1-1 diamix
Yield = 1.26 Ft³/Sx
Fillup = 1106 Ft

100 Sx Regular Cmt
Yield = 1.18 Ft³/Sx
Fillup = 518'

4½" Csg
@ 8804'

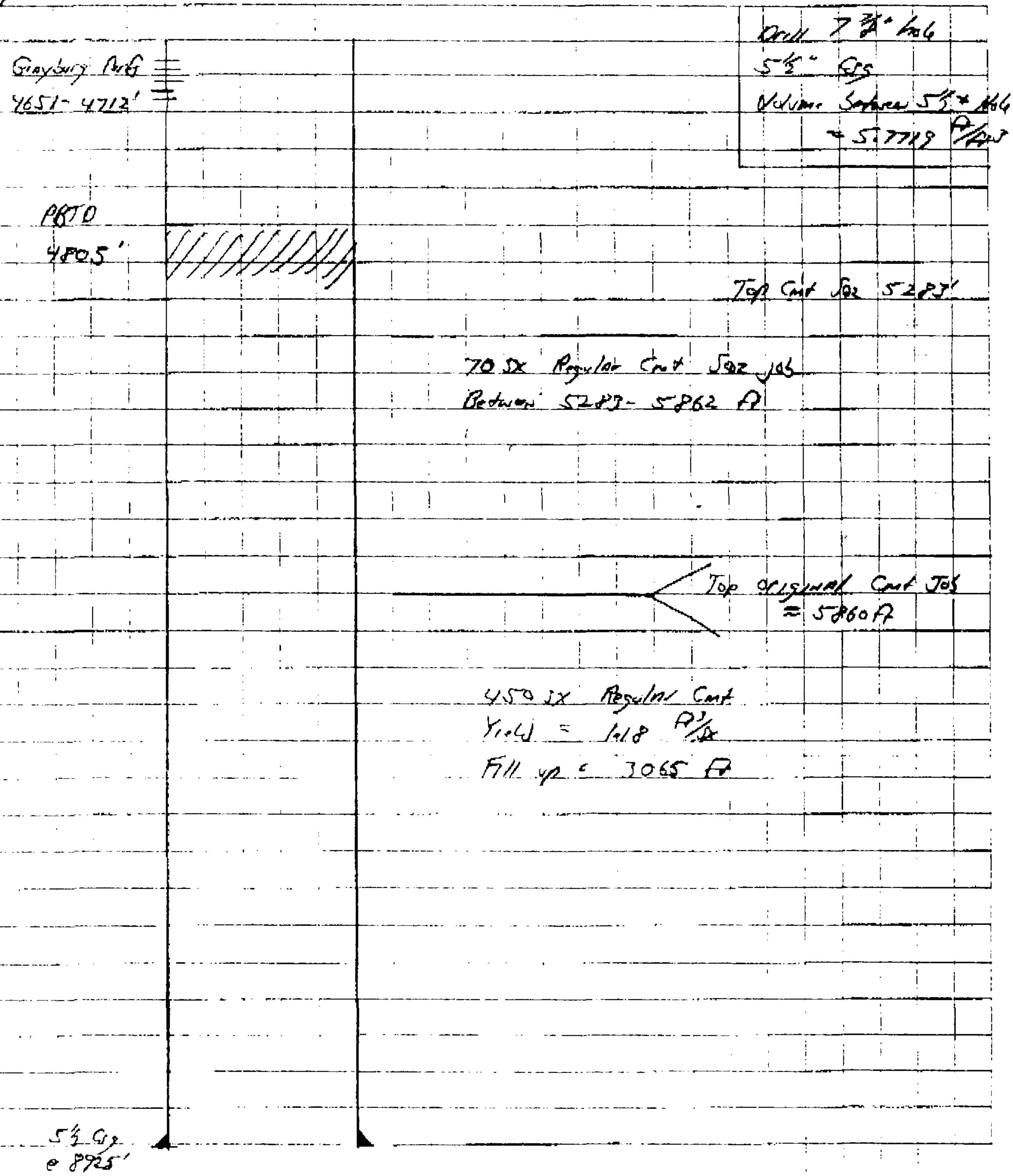
Calculation Record

Union Oil Company of California

Prepared by: G. Fitzgerald | Checked by: | Date: 4/21/92 | Sheet of

W.O. / A.F.E. no.

Title: Wyatt A #9 Well



Calculation Record

Union Oil Company of California

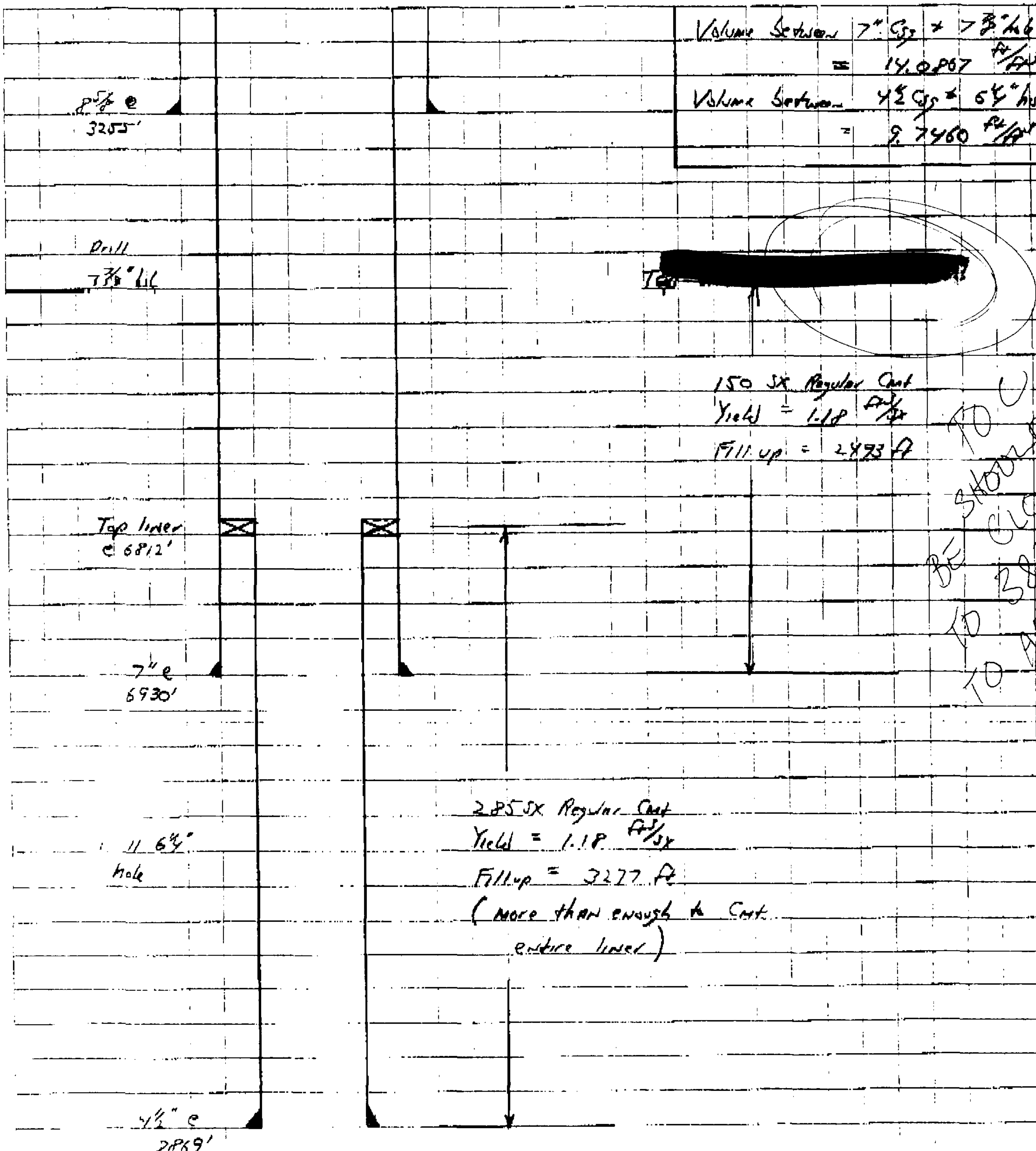
UNION 76

Prepared by	Checked by	Date	Sheet
G. Fitzgerald		4/21/92	of

Title	W.O. / A.F.E. no.
Lea - State 'KG' #1 Well	

Volume between 7" Csg & 7 7/8" hole = 14.0807 ft/ft^3

Volume between 4 1/2 Csg & 6 3/4" hole = 9.7460 ft/ft^3



TOC SHOULD BE CLOSE TO 3878' TO APPROVE

Unocal North American
Oil & Gas Division
Unocal Corporation
1004 North Big Spring, P.O. Box 671
Midland, Texas 79702
Telephone (915) 682-9731

UNOCAL 76

Southwestern Region
Andrews District

April 23, 1992

Mr. Ben Stone
New Mexico Oil Conservation District

After our conversation of April 22, 1992, regarding the Chevron operated Lea-State "KG" #1 Well, I was able to obtain well data directly from Chevron. Their records indicate a calculated top of cement behind the 7" casing at 4141'. Undoubtably, the tight tolerence between the 7" casing and the hole resulted in a poor primary cement job. During 1988, they squeezed the intervals 4875-4968' and 6794-6962'. The records indicate a top of cement to be approximately 4094', providing there was no cement behind the pipe when the squeeze was performed. It's possible that the primary job had fingered up the hole and these squeeze jobs filled in the voids. If this has occurred, enough total cement has been pumped to tie back into to 8-5/8" intermediate casing. Another item to consider is that no other casing leaks have developed since 1988. This also may indicate that the corrosive San Andres-Grayburg section has been adequately protected.

Call if you would to discuss this further.

Sincerely,

Union Oil Company of California
dba UNOCAL

Greg Fitzgerald
Sr. Petroleum Engineer

GNF:raa

Attachment

Calculation Record

UNION 76

Sheet

G. Fitzgerald 4/21/92

Lea - State 'KG' #1 Well

Volume between 7" Csg & 7⅜" hole
= 14.0807 ft/ft³

Volume between 4½ Csg & 6¼" hole
= 8.7460 ft/ft³

8⅝" @ 3255'

Drill 7⅜" hole

Both SQZ's occured during same job in 1988

No further leaks noted since

SQZ Csg leak 4875' - 4968'
4/47 sx
Calc TOC = 4094'

SQZ Csg leak 6794 - 6862
Calc TOC = 4670'

Chevron records indicate calc top

Top Cmt behind 7" → 4957'

150 sx Regular Cmt
Yield = 1.18 ft³/sx
Fill up = 2493 ft

Top liner @ 6812'

7" @ 6930'

285 sx Regular Cmt
Yield = 1.18 ft³/sx
Fillup = 3277 ft
(more than enough to Cmt entire liner)

Drill 6¼" hole

4½" @ 7859'

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

New Mexico DRUG FREE It's a State of Mind!

BRUCE KING
GOVERNOR

POST OFFICE BOX 2088
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SANTA FE, NEW MEXICO 87504
(505) 827-5800

May 1, 1992

Unocal Corporation
1004 North Big Spring
P.O. Box 671
Midland, Texas 79702

Attn: Greg Fitzgerald

RE: SWD Application Area of Review
i.e., Lea State "KG" Well No. 1

Dear Greg,

As you are aware from our conversations, I have been attempting to ascertain the integrity of the cement job(s) on the above mentioned well. Through my efforts, as well as yours and at least two Chevron engineers, I have not been able to confirm that any cement exist above approximately 4141' behind the 7" casing string.

The top of the proposed injection zone is 4378' and, as a rule of thumb, we require approximately 500' of cement isolation from the zone of interest in surrounding area of review wells. Hence, the TOC I was looking for would be much closer to 3878 feet. I'm afraid this well does not qualify.

Prior to salt water disposal into the State 35 Well No. 6, the State of New Mexico Oil Conservation Division respectfully requests that Unocal Corporation complete a cement squeeze job on the subject well, currently operated by Chevron U.S.A. The job must yield a top of cement to approximately 3878' to insure zone isolation.

Please notify me of your intentions as the order can be written and approved, stating the above detailed stipulation as a condition of the order, if you would like to proceed with the application.

Please let me know if you have any questions.

Sincerely,

Ben Stone
Engineering Tech II

/BS