Jones, William V., EMNRD

From: Adam Rankin [AGRankin@hollandhart.com]
Sent: Wednesday, May 30, 2012 3:21 PM
To: Jones, William V., EMNRD; Brooks, David K., EMNRD
Subject: RE: Cobalt: Case No. 14834
Attachments: Reef X-sect annotate.pdf; Net Pay.pdf; Net Pay and STructure.pdf; Net Pay and Structure reduced scale.pdf; Net Pay reduced scale.pdf; Structure.pdf; Structure Reduced Scale.pdf; Cobalt Energy Strawn Reef Inj Permit.pptx

Will & David,

Attached to this email please find a report prepared by the petroleum geologist Byron Davis of Hyena Oil & Gas analyzing the structure and pay in the vicinity of the proposed Consolidate No. 3 injection well. He concludes that the producing zones are not connected to the zone targeted by the Consolidated No. 3 well and that, therefore, injection into the Consolidated No. 3 will not affect production from the Strawn. The report also concludes that the Strawn has been depleted of recoverable oil in the vicinity of the Consolidated No. 3 well.

Let me know if you have any further questions or if the attached presentation and exhibits do not address your questions.

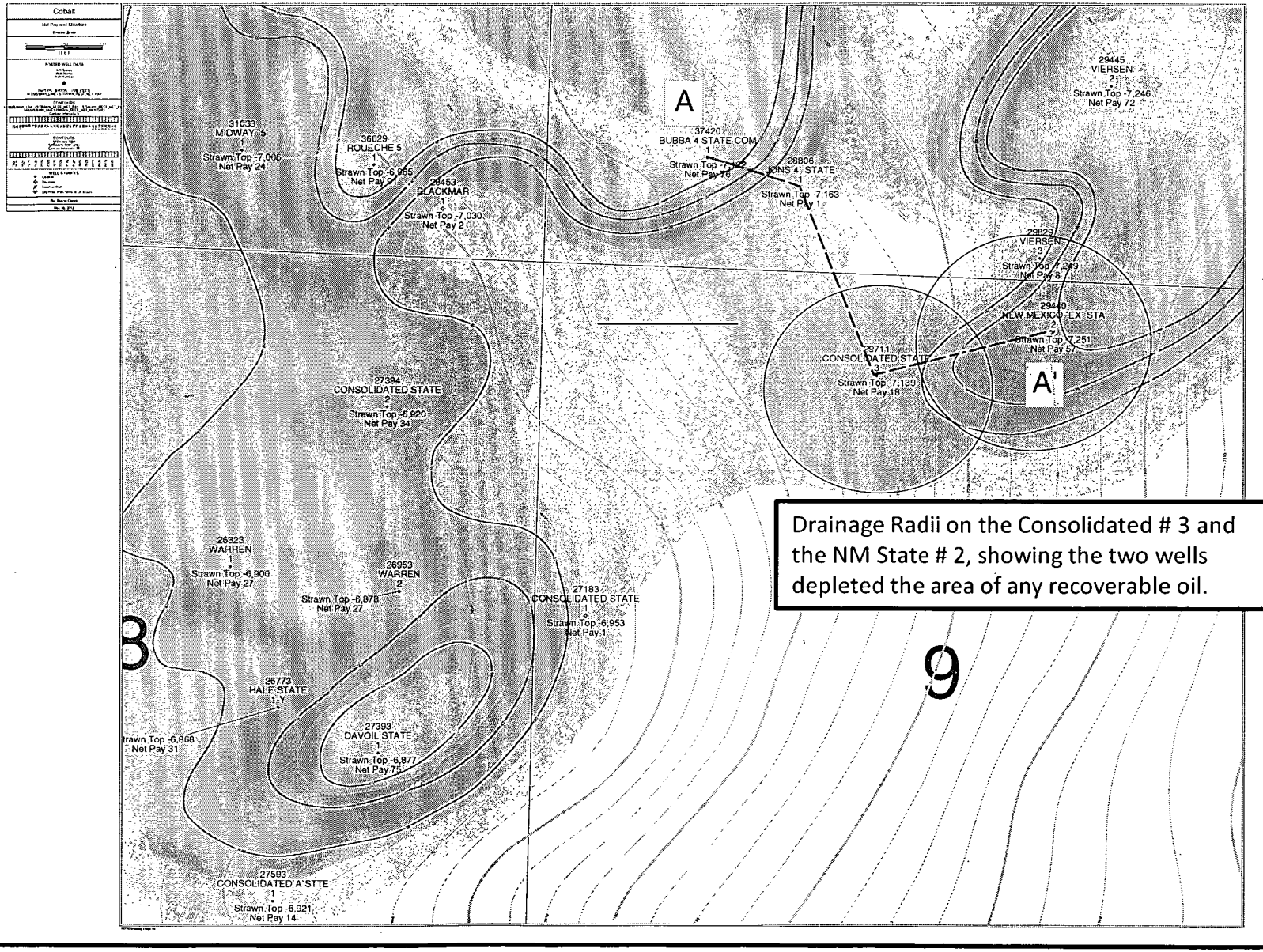
Very best,
Adam

Adam G. Rankin
Holland & Hart LLP
110 North Guadalupe Suite 1
P.O. Box 2208
Santa Fe, NM 87504
Office: (505) 988-4421
Direct: (505) 954-7294
Cell: (505) 570-0377
Fax (505) 983-6043
E-mail: agrankin@hollandhart.com
Download vCard

HOLLAND&HART

DAVID;
THIS ANALYSIS SEEMS FEASIBLY ACCURATE
WVJ 5/31/12

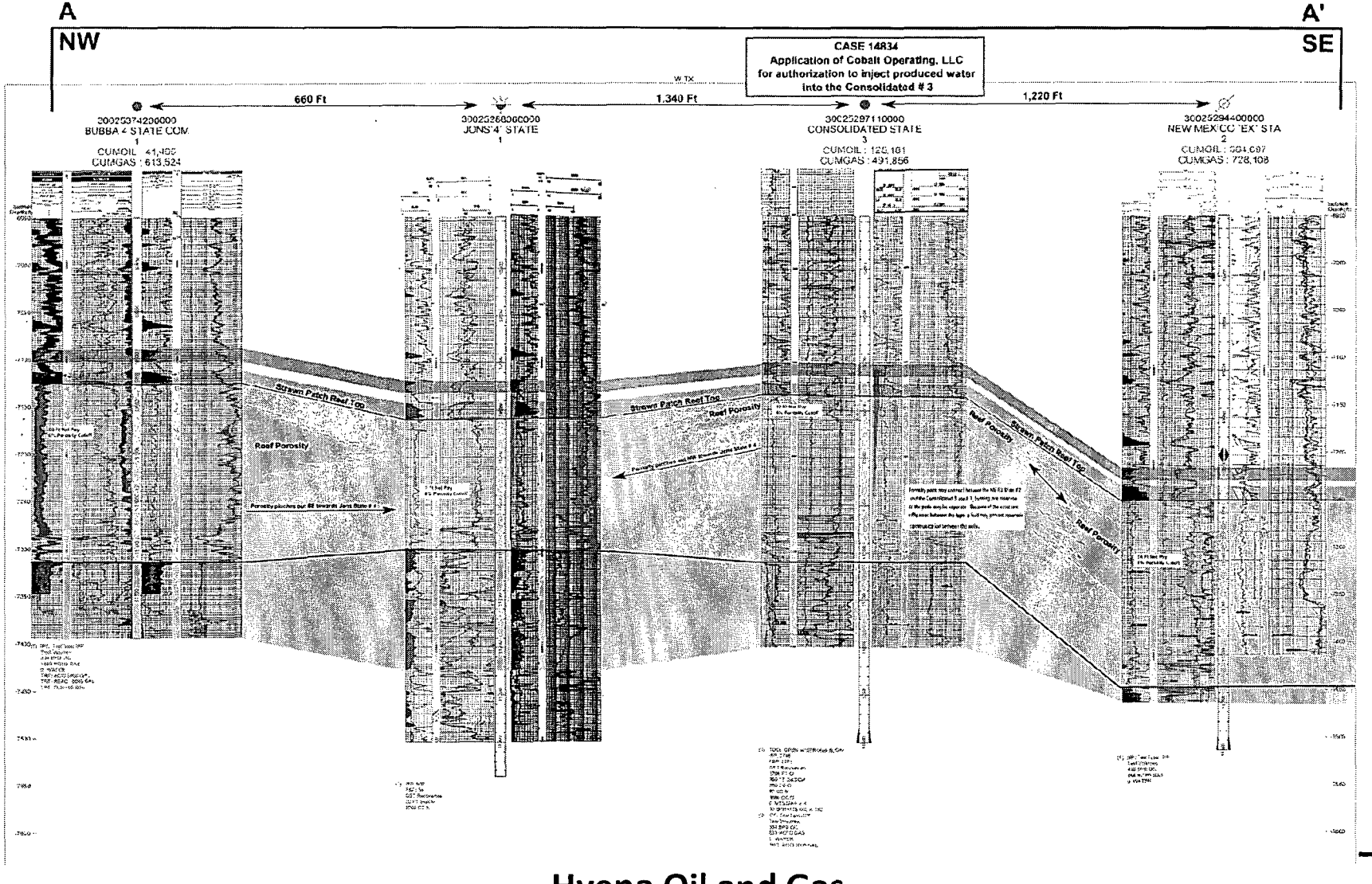
Drainage Radii



Drainage Radii on the Consolidated # 3 and the NM State # 2, showing the two wells depleted the area of any recoverable oil.

Structural X-Sect of Strawn Reef

- ***Structural X-Sect of adjacent wells showing the internally complex porosity of reefs. The Jons 4 State has only 1 ft of net pay and clearly shows why any water injected into the Consolidated # 3 will not affect the Bubba State.***



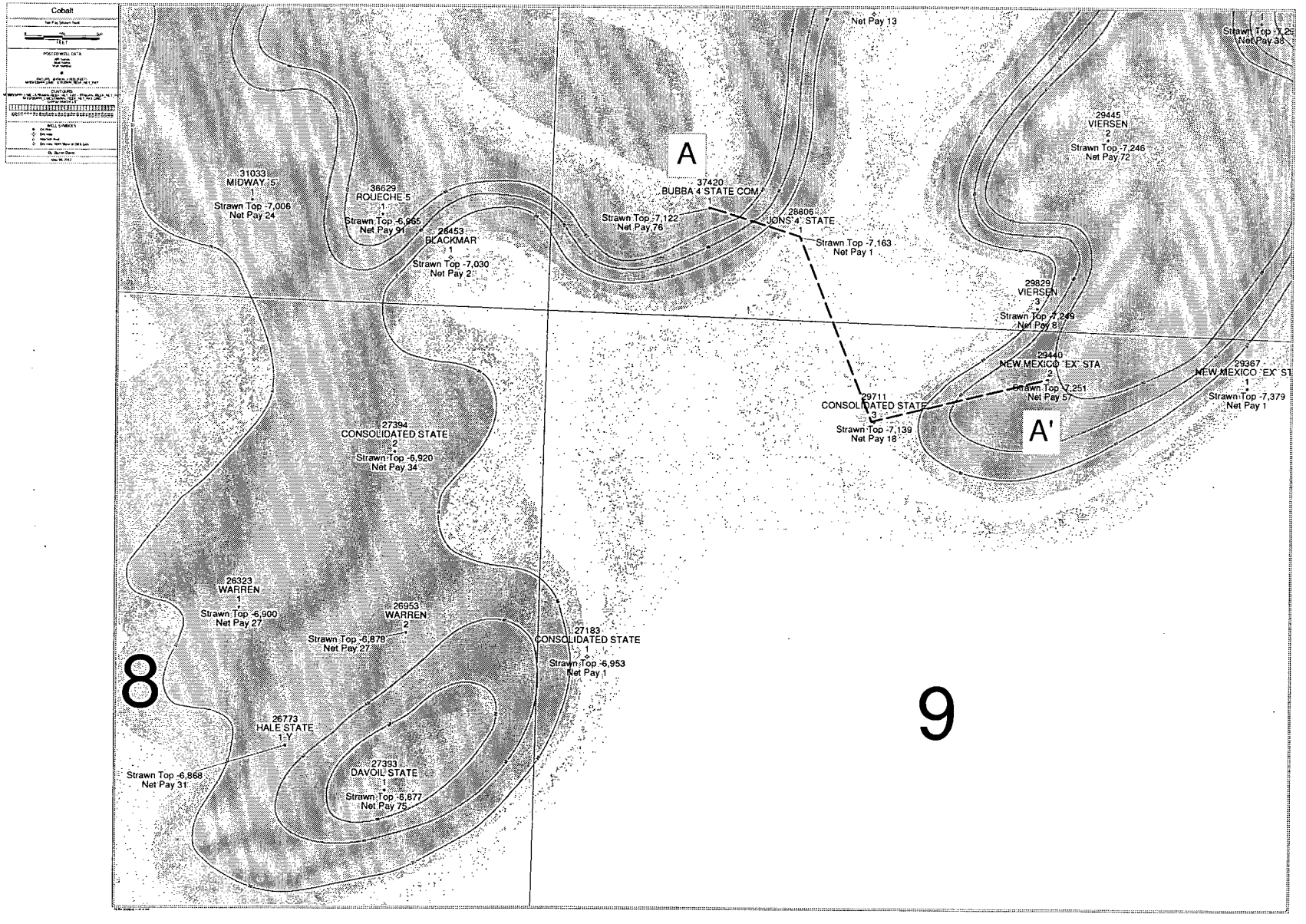
Hyena Oil and Gas

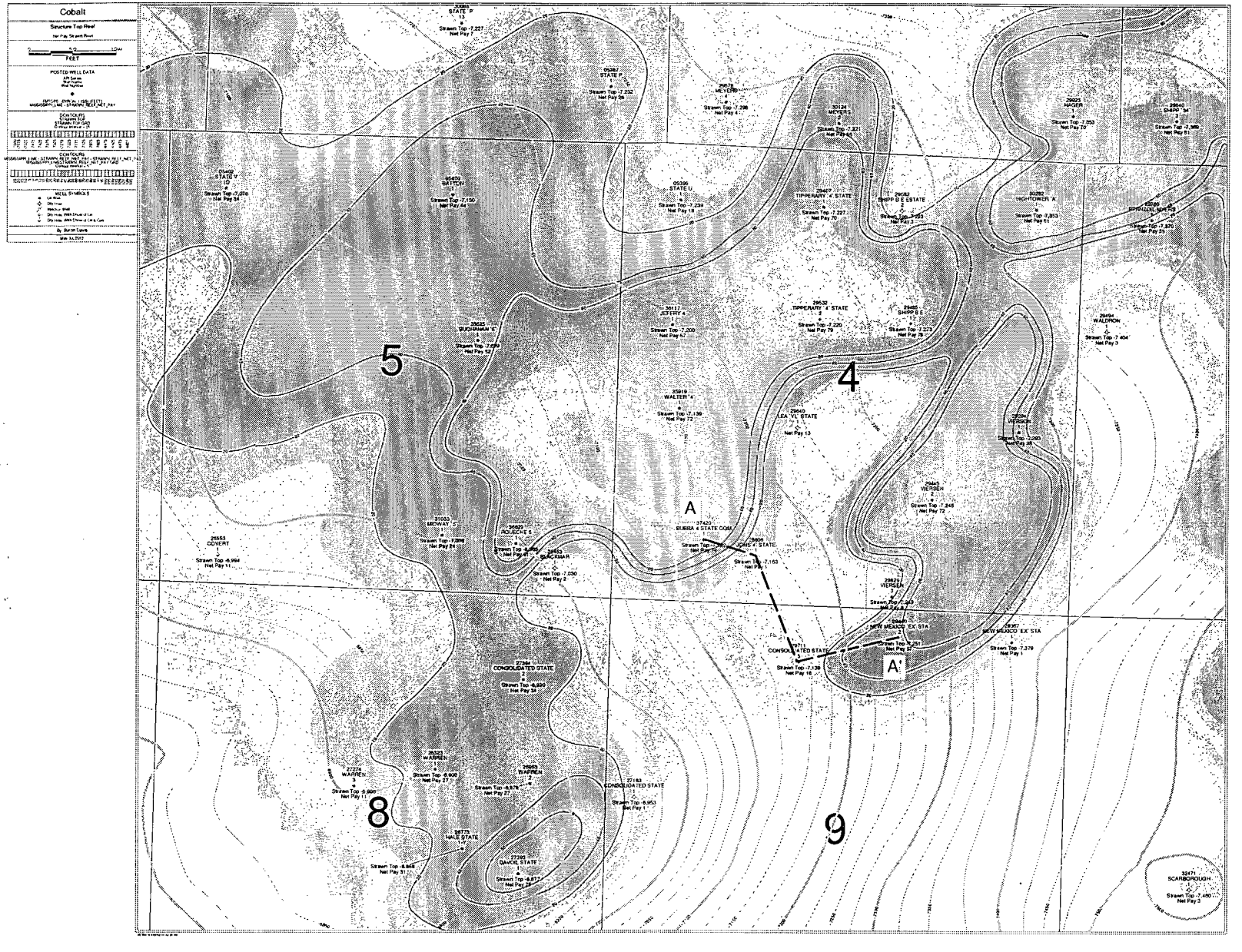
Conclusions

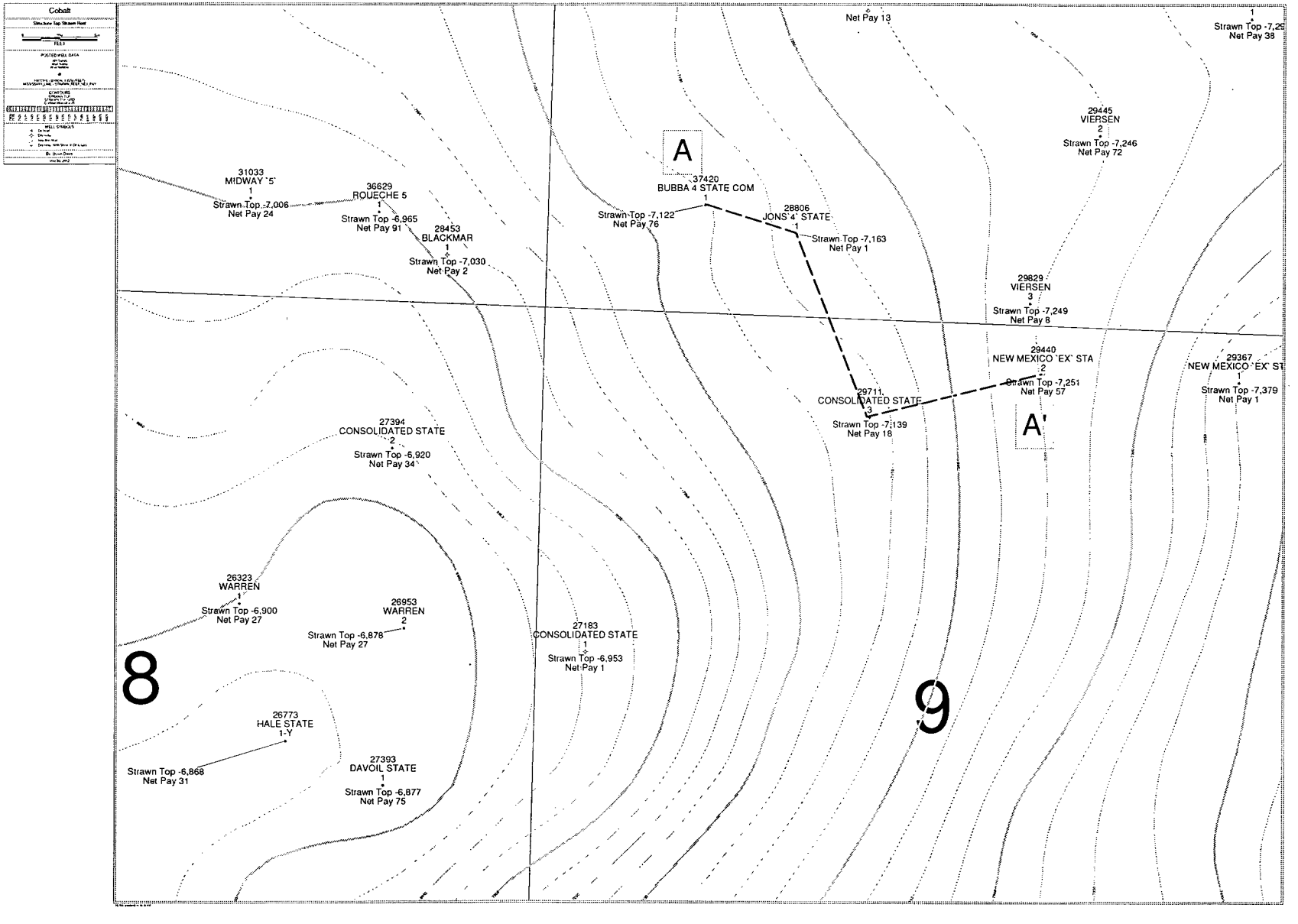
Injecting into the Consolidated State Well No. # 3 will not damage the Strawn reservoir or cause any affect on surrounding Strawn Production.

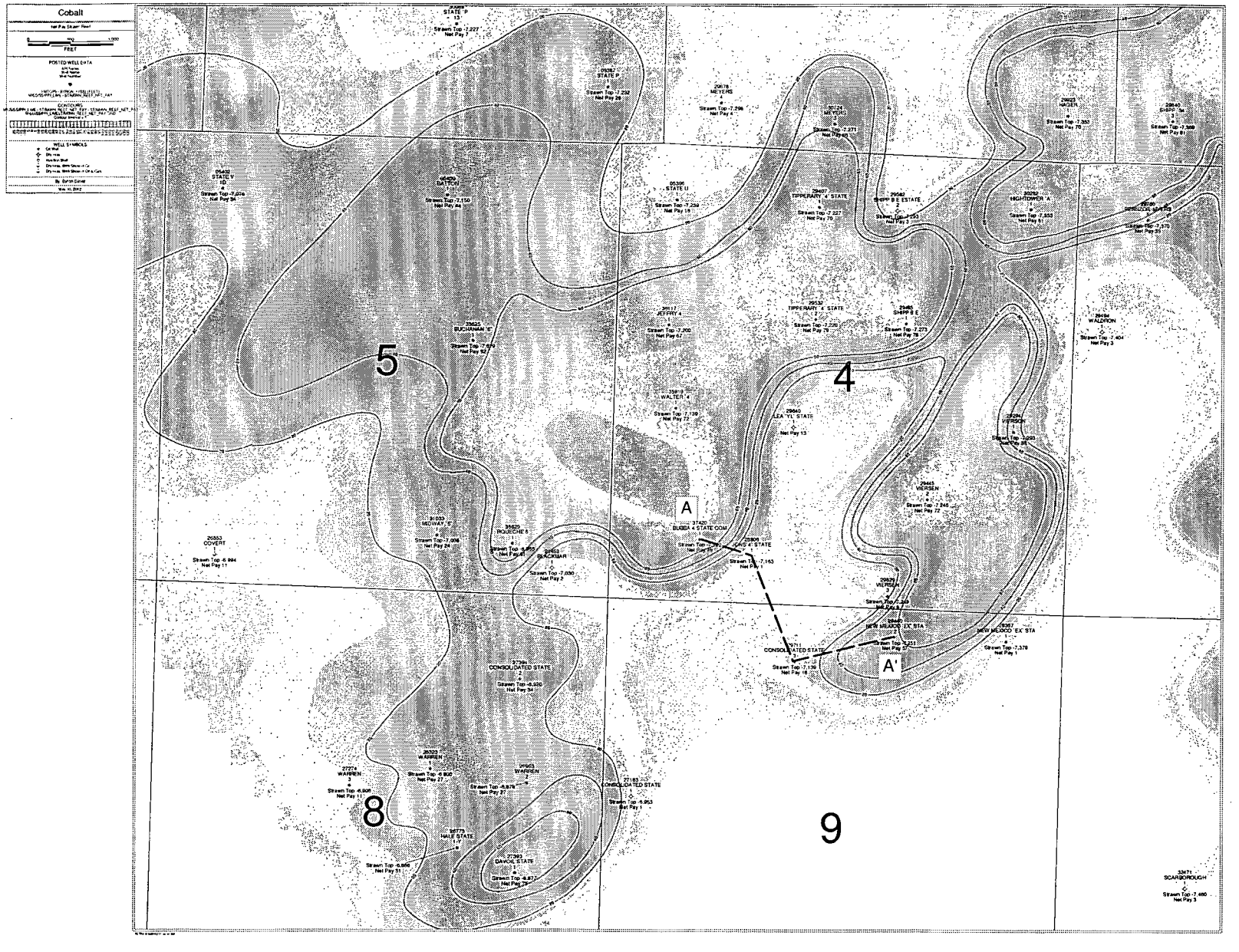
Conclusion:

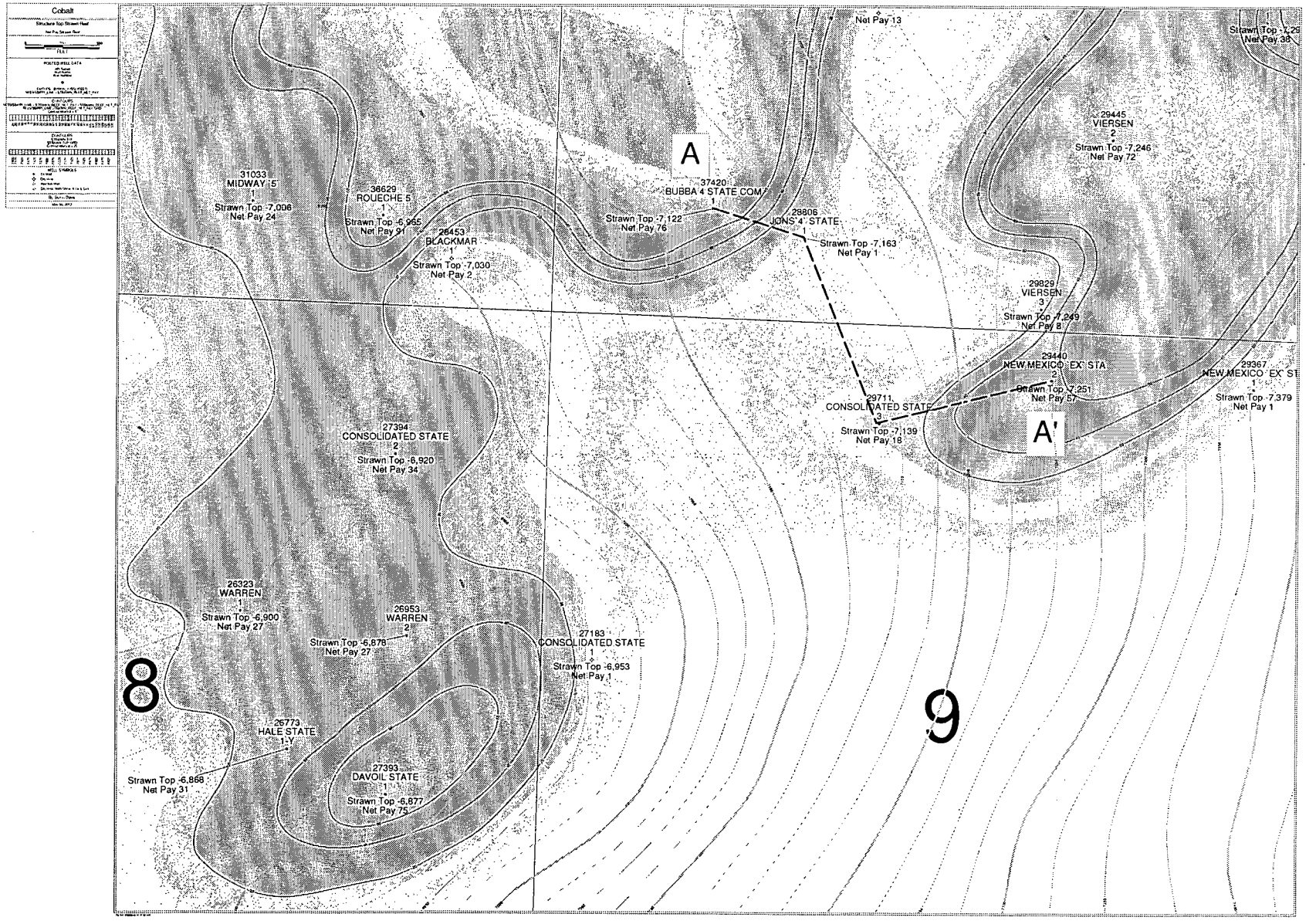
- Net pay maps on these Strawn reservoirs (porosity cutoff greater than 6%), delineate the reefs and show that any water injected into the Consolidated State Well No. # 3 will not affect other nearby Strawn producers, specifically the currently producing Bubba State # 4, because the reservoirs are not connected.
- The Jons 4 State # 1 is a dry hole that clearly indicates the Consolidated # 3 and the Bubba State are not connected. See net pay maps and cross section.
- Net pay maps suggest the Consolidated State Well No. # 3 reservoir is most likely connected to the New Mexico State 2. The New Mexico State # 2 is currently injecting into the Strawn.
- Drainage radii on the New Mexico State # 2 (365 MBO) and the Consolidated State Well No 3 1(25 MBO), imply these wells drained much of the same oil, depleting the area of any recoverable oil.


Cobalt
A
A'
8
9
31033
MIDWAY 5
1
Strawn Top -7,006
Net Pay 24
36629
ROUECHE 5
1
Strawn Top -6,965
Net Pay 91
26453
BLACKMAR
1
Strawn Top -7,030
Net Pay 2
37420
BUBBA 4 STATE COM
1
Strawn Top -7,122
Net Pay 76
28806
JONS 4 STATE
1
Strawn Top -7,163
Net Pay 1
Net Pay 13
29445
VIERSEN
2
Strawn Top -7,246
Net Pay 72
29829
VIERSEN
3
Strawn Top -7,249
Net Pay 8
29440
NEW MEXICO 'EX' STA
2
Strawn Top -7,251
Net Pay 57
29711
CONSOLIDATED STATE
3
Strawn Top -7,139
Net Pay 18
29367
NEW MEXICO 'EX' ST
1
Strawn Top -7,379
Net Pay 1
27394
CONSOLIDATED STATE
2
Strawn Top -6,920
Net Pay 34
26323
WARREN
1
Strawn Top -6,900
Net Pay 27
26953
WARREN
2
Strawn Top -6,878
Net Pay 27
27183
CONSOLIDATED STATE
1
Strawn Top -6,953
Net Pay 1
26773
HALE STATE
1-Y
Strawn Top -6,868
Net Pay 31
27393
DAVOIL STATE
1
Strawn Top -6,877
Net Pay 75


Cobalt
Structure Top Reef
Net Pay Stream Reef
FEET
POSTED WELL DATA
CONTOURS
WELLS SYMBOLS
5
4
8
9
A
A'


Cobalt
Net Pay 13
1
Strawn Top -7,25
Net Pay 38
29445
VIERSEN
2
Strawn Top -7,246
Net Pay 72
A
37420
BUBBA 4 STATE COM
1
Strawn Top -7,122
Net Pay 76
28806
JONS `4` STATE
1
Strawn Top -7,163
Net Pay 1
31033
MIDWAY `5`
1
Strawn Top -7,006
Net Pay 24
36629
ROUECHE 5
1
Strawn Top -6,965
Net Pay 91
28453
BLACKMAR
1
Strawn Top -7,030
Net Pay 2
29829
VIERSEN
3
Strawn Top -7,249
Net Pay 8
29440
NEW MEXICO `EX` STA
2
Strawn Top -7,251
Net Pay 57
29367
NEW MEXICO `EX` ST
1
Strawn Top -7,379
Net Pay 1
29711
CONSOLIDATED STATE
3
Strawn Top -7,139
Net Pay 18
A'
27394
CONSOLIDATED STATE
2
Strawn Top -6,920
Net Pay 34
26323
WARREN
1
Strawn Top -6,900
Net Pay 27
26953
WARREN
2
Strawn Top -6,878
Net Pay 27
27183
CONSOLIDATED STATE
1
Strawn Top -6,953
Net Pay 1
8
9
26773
HALE STATE
1-Y
Strawn Top -6,868
Net Pay 31
27393
DAVOIL STATE
1
Strawn Top -6,877
Net Pay 75


Cobalt
5
4
8
9
A
A'


Cobalt
A
A'
8
9
Net Pay 13
31033
MIDWAY 5
1
Strawn Top -7,006
Net Pay 24
36629
ROUECHE 5
1
Strawn Top -6,955
Net Pay 91
26453
BLACKMAR
1
Strawn Top -7,030
Net Pay 2
37420
BUBBA 4 STATE COM
1
Strawn Top -7,122
Net Pay 76
29806
JONS 4 STATE
1
Strawn Top -7,163
Net Pay 1
29445
VIERSEN
2
Strawn Top -7,246
Net Pay 72
29829
VIERSEN
3
Strawn Top -7,249
Net Pay 8
29440
NEW MEXICO EX STA
2
Strawn Top -7,251
Net Pay 57
29711
CONSOLIDATED STATE
2
Strawn Top -7,139
Net Pay 18
29367
NEW MEXICO EX ST
1
Strawn Top -7,379
Net Pay 1
27394
CONSOLIDATED STATE
2
Strawn Top -6,920
Net Pay 34
26323
WARREN
1
Strawn Top -6,900
Net Pay 27
26953
WARREN
2
Strawn Top -6,878
Net Pay 27
27183
CONSOLIDATED STATE
1
Strawn Top -6,953
Net Pay 1
26773
HALE STATE
1-Y
Strawn Top -6,868
Net Pay 31
27393
DAVOIL STATE
1
Strawn Top -6,877
Net Pay 75

A

A'

NW

SE

CASE 14834
Application of Cobalt Operating, LLC for authorization to inject produced water into the Consolidated # 3

W TX

660 Ft

1,340 Ft

1,220 Ft

30025374200000
BUBBA 4 STATE COM
1
CUMOIL : 41,406
CUMGAS : 613,524

30025288060000
JONS'4' STATE
1

30025297110000
CONSOLIDATED STATE
3
CUMOIL : 125,181
CUMGAS : 491,856

30025294400000
NEW MEXICO 'EX' STA
2
CUMOIL : 364,697
CUMGAS : 728,108

Subsea Depth(ft)

-6950
-7000
-7050
-7100
-7150
-7200
-7250
-7300
-7350
-7400
-7450
-7500
-7550
-7600
-7650
-7700
-7750
-7800

Strawn Patch Reef Top

Reef Porosity

Porosity pinches out SE towards Jons State # 4

Porosity pinches out NW towards Jons State # 4

16 Ft Net Pay
6% Porosity Cutoff

1 Ft Net Pay
6% Porosity Cutoff

57 Ft Net Pay
6% Porosity Cutoff

Porosity pods may connect between the NM EX State # 2 and the Consolidated State # 3, forming one reservoir, or the pods may be separate. Because of the structural difference between the tops, a fault may prevent reservoir communication between the wells.

(1) IPF, TestType IPF
Test Volumes
334 BPD OIL
1589 MCFD GAS
0 WATER
TRT: ACID 5000 GAL
TRT: REAC 10000 GAL
TRT: FLSH 80 BBL

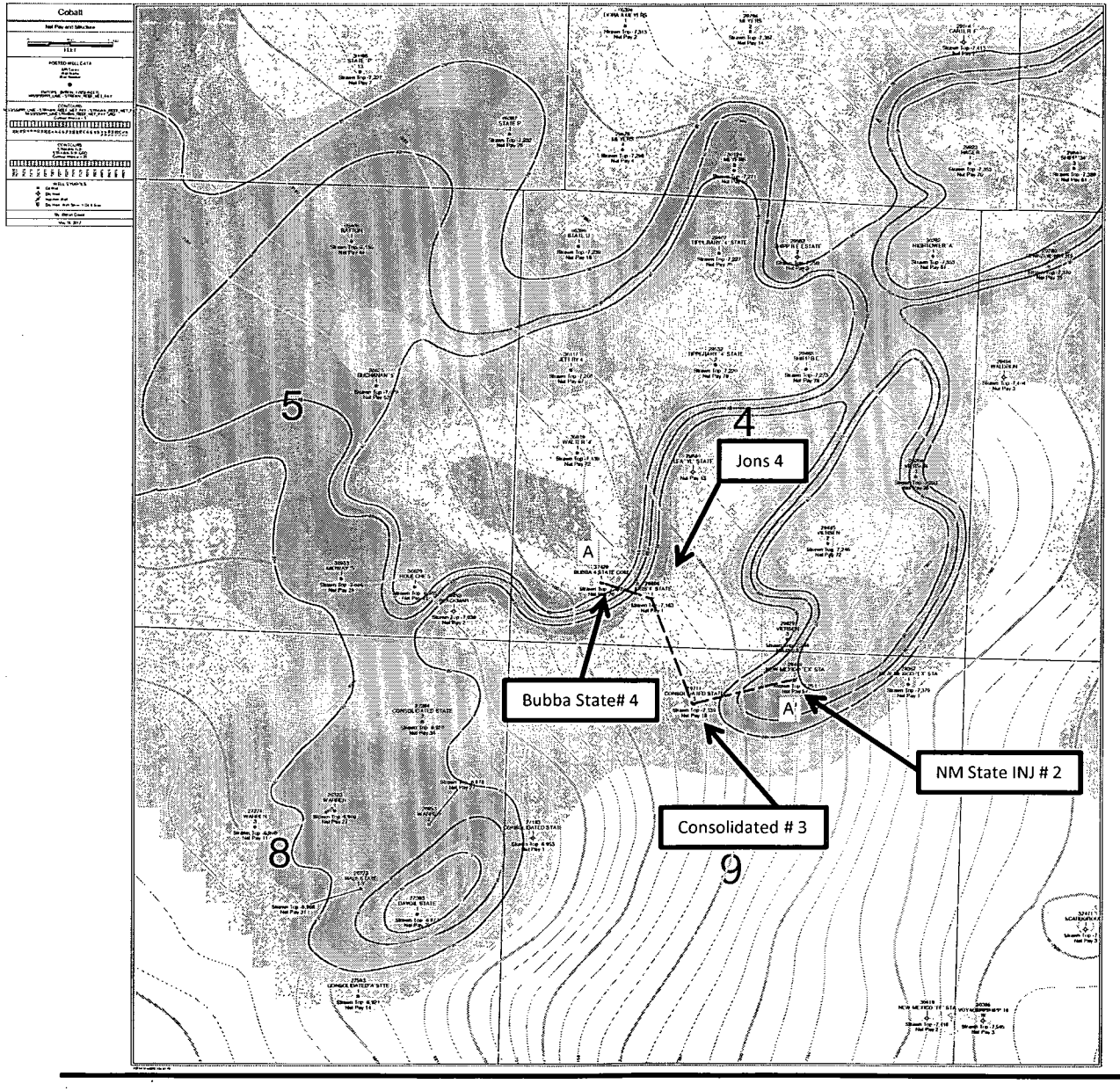
(1) ISP: 907
FSP: 55
DST Recoveries
20 FT SGCM
2000 CC M

(1) TOOL OPEN W/STRONG BLOW
ISP: 2748
FSP: 2721
DST Recoveries
3756 FT G
760 FT OS GCM
860 CC O
60 CC M
1680 CC G
0 MTS GAS in 4
10 BPH MTS OIL in 150
(2) IPF, TestType IPF
Test Volumes
564 BPD OIL
833 MCFD GAS
0 WATER
TRT: ACID 1000 GAL

(1) IPF, TestType IPF
Test Volumes
452 BPD OIL
494 MCFD GAS
0 WATER

US-147

Net Pay and Structure



- Net Pay is on 20 ft contours with yellow color fill indicating the reef has > 60 ft Net Pay

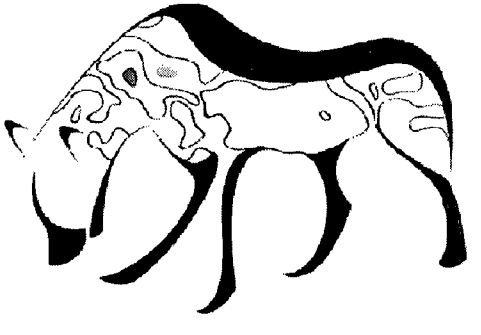
- Structure is on 25 ft contours with the field dipping towards the NE

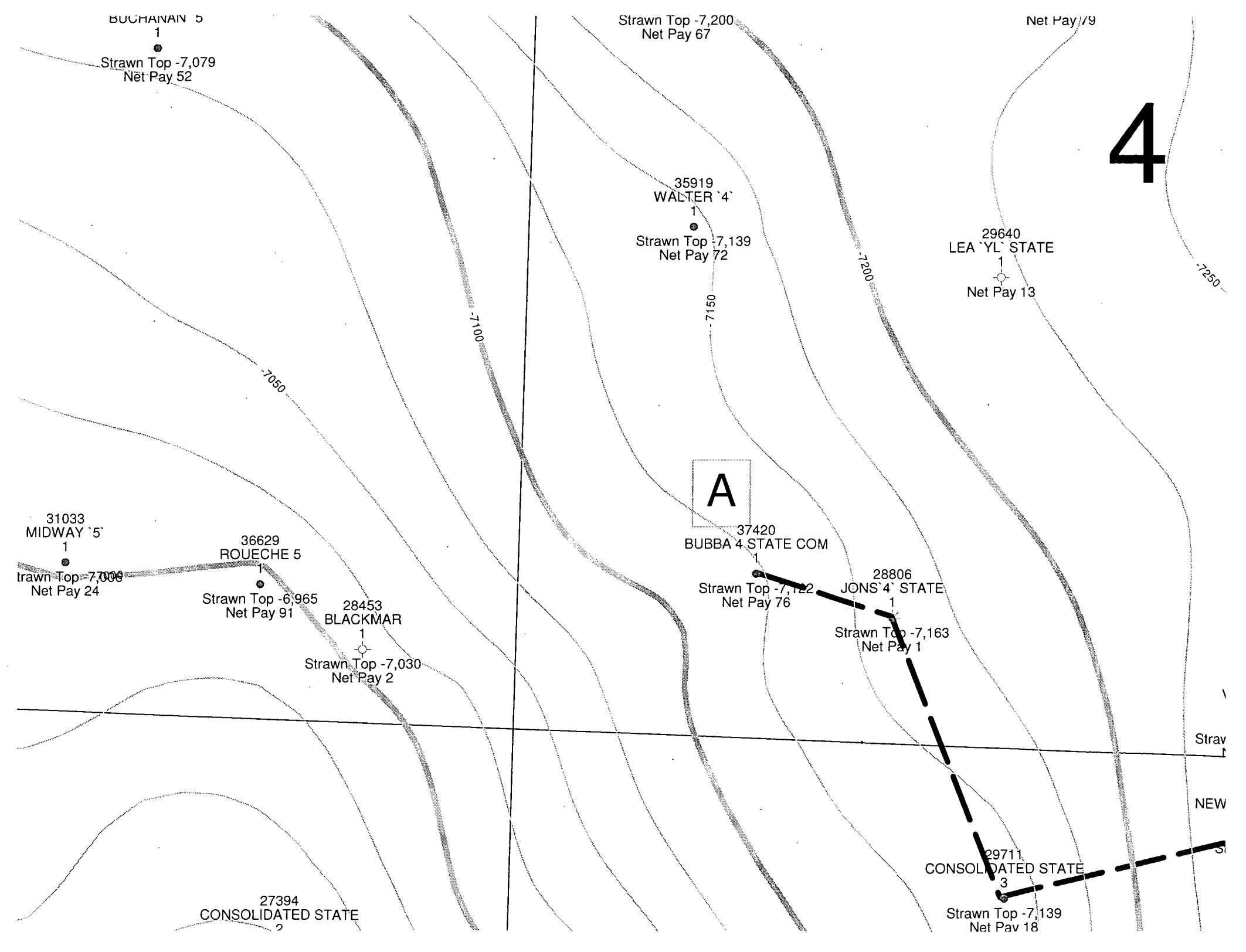
- Net Pay shows the Bubba State # 4 is in a different reef than the Consolidated # 3 and the NM State # 2. The Jons 4 dryhole gives proof of this seperation. This is why water injected into the NM State # 2 is not affecting production in the Bubba State # 4.

Executive Summary

Injection Permit for Consolidated State # 3

Lea, NM




BUCHANAN 5
1
Strawn Top -7,079
Net Pay 52
Strawn Top -7,200
Net Pay 67
Net Pay 79
4
35919
WALTER `4`
1
Strawn Top -7,139
Net Pay 72
29640
LEA `YL` STATE
1
Net Pay 13
-7100
-7150
-7200
-7250
-7050
A
31033
MIDWAY `5`
1
Net Pay 24
36629
ROUECHE 5
1
Strawn Top -6,965
Net Pay 91
28453
BLACKMAR
1
Strawn Top -7,030
Net Pay 2
37420
BUBBA 4 STATE COM
1
Net Pay 76
28806
JONS`4` STATE
1
Strawn Top -7,163
Net Pay 1
Strav
NEW
29711
CONSOLIDATED STATE
3
Strawn Top -7,139
Net Pay 18
27394
CONSOLIDATED STATE

Summary

Cobalt Operating, LLC is seeking authorization to inject produced water into the Consolidated State Well No. # 3 (API 30-025-29711)in Section 9, Township 17 S, Range 37 E, Lea New Mexico.

Problem:

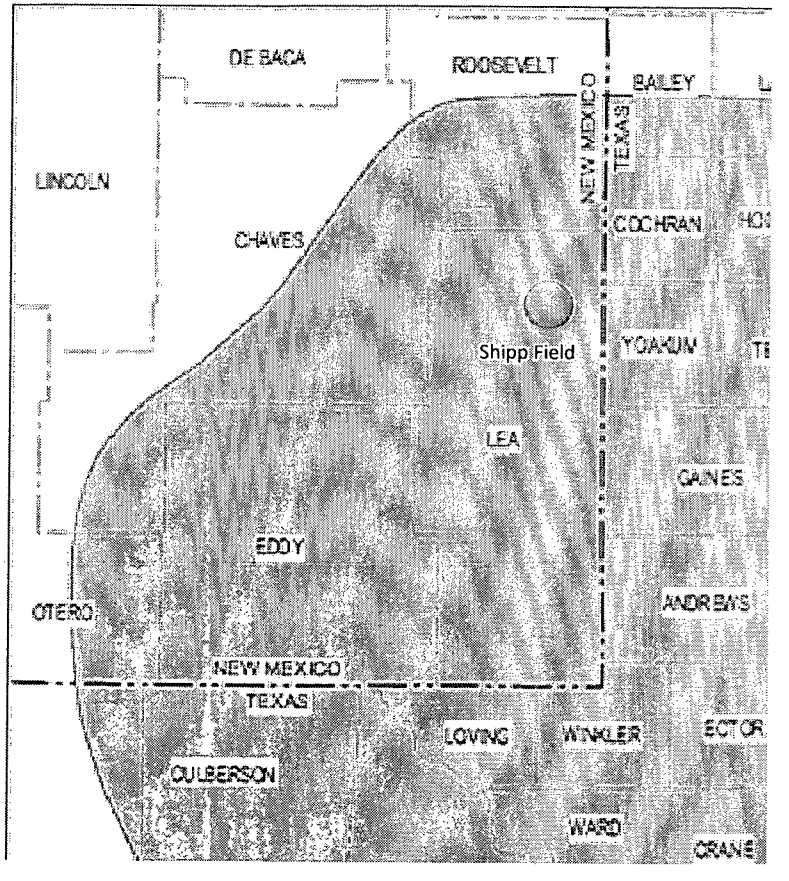
- Will injecting water into the Strawn reservoir of the Consolidated State Well No # 3 damage the Strawn oil and gas reservoir.

Conclusion:

- Water will not affect surrounding production or hurt the oil and gas reservoir because:
  - 1) Surrounding Strawn production is not connected to the same reservoir for which Cobalt Operating LLC will inject water into
  - 2) The Strawn reservoir in this well and nearby, has been well drained of any recoverable oil.

Geology:

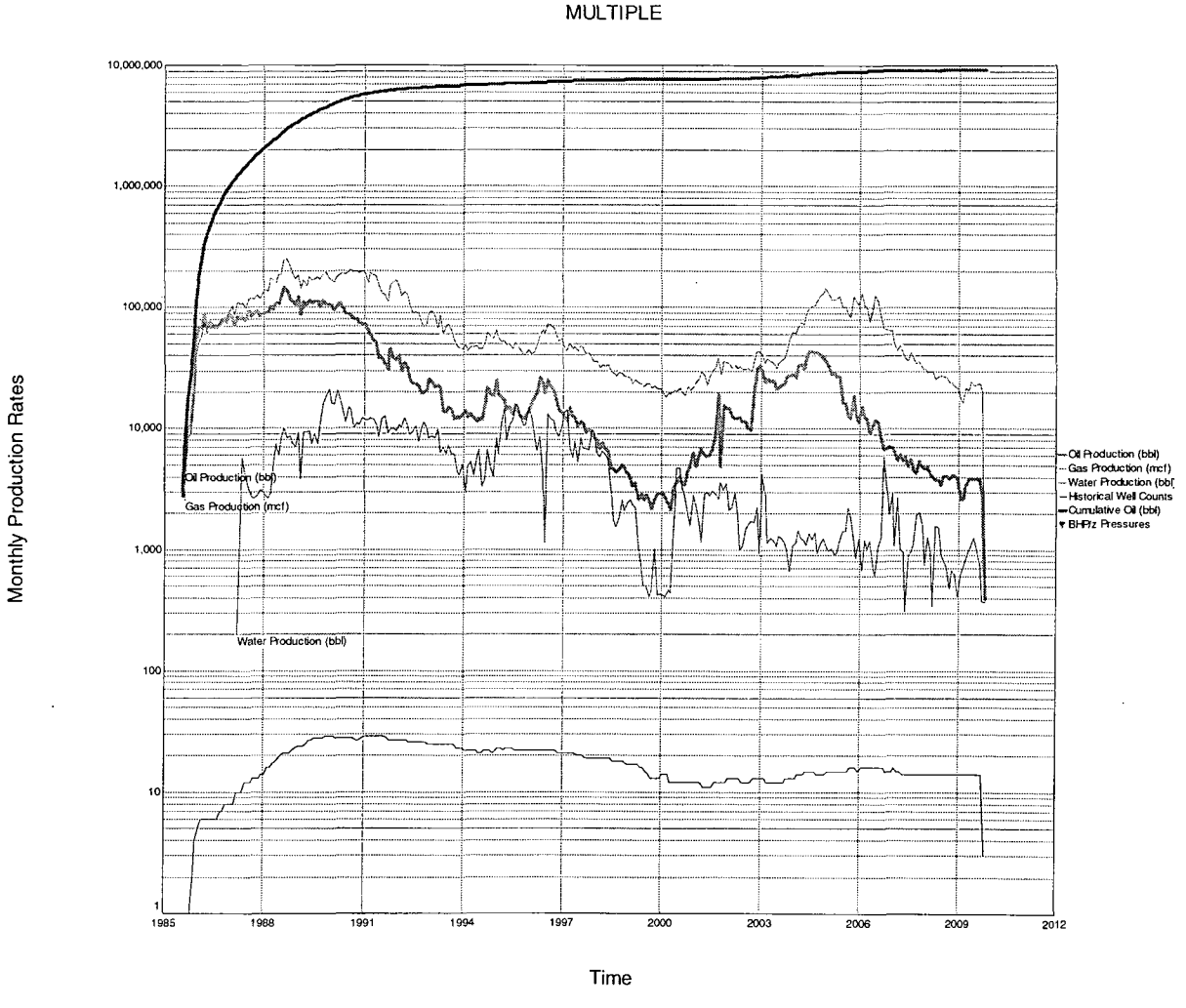
- Reservoirs are patch reefs of Strawn (Desmoinesian: Middle Pennsylvanian) age. The patch reefs grew on a south-dipping carbonate ramp that was present before the western Permian Basin segmented into the Northwest Shelf and the Delaware Basin. Reservoirs are principally bioherms composed of phylloid algal, coralgal, and foraminiferal lime wackestones and packstones (Harris, 1990). Bioherm growth was localized on preexisting structures that had bathymetric expression (Harris, 1990). Seals are interbedded marine mudstones. **The larger Strawn reservoirs are internally complex and exhibit intricate porosity variations.**



Harris, D. C., 1990, Ramp buildups in the lower Strawn limestone (Penn.): controls on stratigraphic reservoir variability, in Flis, J. E., and Price, R. C., eds., Permian Basin oil and gas fields: innovative ideas in exploration and development: West Texas Geological Society, Publication 90-87, p. 91–101.

Shipp Production

The Shipp Field discovered in 1985 has produced over 9.3 Million barrels of oil and 22 BCF of Gas. The field is in decline.



Net Pay and Structure