DHC 5/3/99

ARCO Permian

600 North Marienfeld
Midland, TX 79701-4373
P.O. Box 1610
Midland, TX 79702-1610
Telephone 915-688-5570
Facsimile 915-688-5956
Email ecasbee@mail.arco.com

Elizabeth A. Casbeer
Regulatory/Compliance Analyst

3326

Arpil 9, 1999

New Mexico Oil Conservation Division
ATTN: David Catanach
2040 S. Pacheco Street
Santa Fe, NM 87505

RE: Application of ARCO Permian
for Downhole Comminlging on
Washington State "33" Well Nos. 27 & 28
Artesia (QGSA) and Artesia (Glor-Yeso) Fields
Eddy Co., NM

Mr. Catanach:

ARCO Permian respectfully requests administrative approval for downhole commingling on the Washington State "33" Well Nos. 27 and 28. Attached are the supporting documents for this application.

If you have any questions, please contact me at 915/688-5570. Please send the approved permit to:

ARCO Permian
ATTN: E. A. CASBEER, Room 959-54
P. O. Box 1610
Midland, TX 79702

Yours very truly,

Elizabeth A. Casbeer
Regulatory Compliance Analyst

Attachments

xc: Larry Henson – EUN
Donald Knipe – 61323/MIO
Central Files - 041/MIO
R/C Files

ARCO Permian
Downhole Commingling
Washington State "33" Lease
Section 33, T-17S, R-28E
Eddy County, New Mexico

Well No. 27
API: 30-015-22605
815' FSL & 2525' FWL (O)

Well No. 28
API: 30-015-22124
313' FSL & 2490' FWL (O)

Surface Owners for Unit O:

Bogle, Ltd.
P. O. Box 460
Dexter, NM 88230-0460

Offset Operators:

Altura Energy, Ltd.
Attn: Mr. Jerry D. West
P.O. Box 4294
Houston, TX 77210-4294

Bulldog Energy Corp.
P. O. Box 668
Artesia, NM 88210

Mack Chase, Trustee
P. O. Box 1767
Artesia, NM 88211-1767

STATE OF TEXAS

COUNTY OF MIDLAND

BEFORE ME, the undersigned authority on this day personally appeared Elizabeth A. Casbeer, an Regulatory Compliance Analyst with **ARCO Permian**, who being by me duly sworn, deposes and states that the persons listed on the foregoing attached list have been sent a copy on April 9, 1999, of the New Mexico Oil Conservation Division Form C-107 entitled, "Application For Downhole Commingling" for the Washington State "33" Well Nos. 27 and 28, located in Section 33, T17S, R28E, Eddy County New Mexico.

ARCO Permian

Elizabeth A. Casbeer

SUBSCRIBED AND SWORN TO before me on April 9, 1999, to certify which witness my hand and seal of office.

LYDIA P. McBRAYER
NOTARY PUBLIC
STATE OF TEXAS
My Comm. Exp. 06-22-99

NOTARY PUBLIC, STATE OF TEXAS

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980
DISTRICT II
811 South First St., Artesia, NM 88210-2835
DISTRICT III
1000 Rio Brazos Rd, Aztec, NM 87410-1693

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

2040 S. Pacheco
Santa Fe, New Mexico 87505-6429

APR 12 1999

Form C-107-A
New 3-12-96

APPROVAL PROCESS:
X Administrative __Hearing

EXISTING WELLBORE
X YES __ NO

APPLICATION FOR DOWNHOLE COMMINGLING

ARCO Permian (Operator) P.O. Box 1610 Midland, TX 79702 (Address)

Washington State "33" No. 27 (Lease) 0-33-17S-28E (Well No. - Unit Ltr. - Sec - Twp - Rge) Eddy (County)

OGRID NO. 000990 Property Code 22954 API NO. 30-015-22605 Spacing Unit Lease Types: (check 1 or more) Federal ___, State X, (and/or) Fee ___

The following facts are submitted in support of downhole commingling:	Upper Zone	Intermediate Zone	Lower Zone
1. Pool Name and Pool Code	Artesia (Queen,Grbg, S.A.)		Artesia Glorieta, Yeso
2. Top and Bottom of Pay Section (Perforations)	2468'-3032		3750-4200'
3. Type of production (Oil or Gas)	Oil		Oil
4. Method of Production (Flowing or Artificial Lift)	Artifical Lift		Artifical Lift
5. Bottomhole Pressure Oil Zones - Artificial Lift: Estimated Current Gas & Oil - Flowing: Measured Current All Gas Zones: Estimated Or Measured Original	a. (Current) 70	a.	a. 75
	b. (Original)	b.	b.
6. Oil Gravity (°API) or Gas BTU Content	40-42° API		42° API
7. Producing or Shut-In?	Producing		Awaiting Perfs
Production Marginal? (yes or no)	yes		Expected in 3to 6 months
* If Shut-In, give date and oil/gas/ water rates of last production Note: For new zones with no production history, applicant shall be required to attach production estimates and supporting data	Date: Rates: N/A	Date: Rates:	Date: Rates: N/A
* If Producing, give date andoil/gas/ water rates of recent test (within 60 days)	Date: 2/22/99 Rates: 13 BOPD 42 BWPD 36 MCFGPD	Date: Rates:	Date: Rates: N/A
8. Fixed Percentage Allocation Formula -% for each zone	Oil: 27 % Gas: 27 %	Oil: % Gas: %	Oil: 73 % Gas: 73 %

9. If allocation formula is based upon something other than current or past production, or is based upon some other method, submit attachments with supporting data and/or explaining method and providing rate projections or other required data.

10. Are all working, overriding, and royalty interests identical in all commingled zones? X Yes ___ No
If not, have all working, overriding, and royalty interests been notified by certified mail? ___ Yes ___ No
Have all offset operators been given written notice of the proposed downhole commingling? X Yes ___ No

11. Will cross-flow occur? ___ Yes X No If yes, are fluids compatible, will the formations not be damaged, will any cross-flowed production be recovered, and will the allocation formula be reliable. ___ Yes ___ No (If No, attach explanation)

12. Are all produced fluids from all commingled zones compatible with each other? X Yes ___ No

13. Will the value of production be decreased by commingling? ___ Yes X No (If Yes, attach explanation)

14. If this well is on, or communitized with, state or federal lands, either the Commissioner of Public Lands or the United States Bureau of Land Management has been notified in writing of this application. X Yes ___ No

15. NMOCD Reference Cases for Rule 303(D) Exceptions: ORDER NO(S). _____

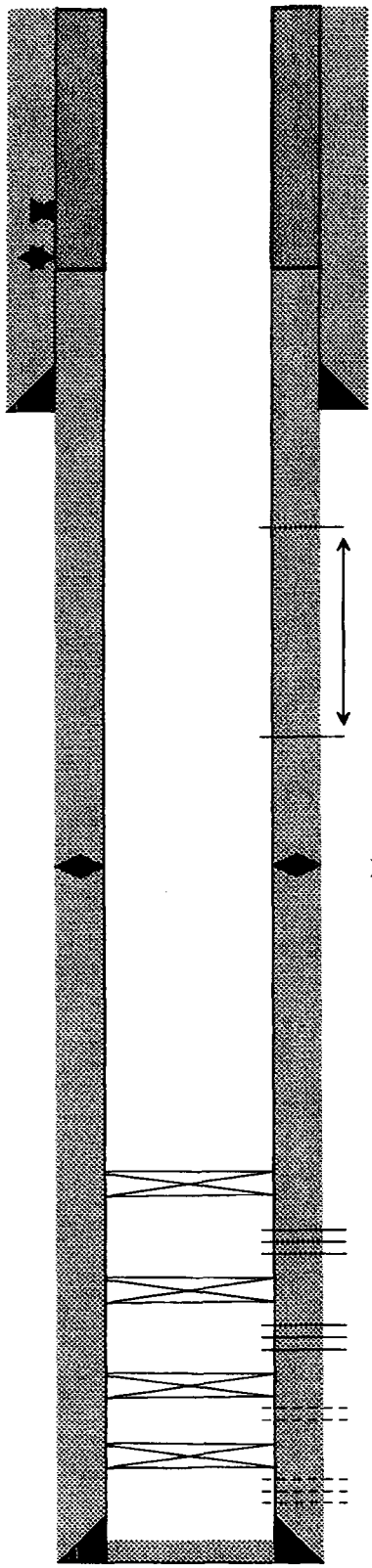
16. ATTACHMENTS:
* C-102 for each zone to be commingled showing its spacing unit and acreage dedication.
* Production curve for each zone for at least one year. (If not available, attach explanation.)
* For zones with no production history, estimated production rates and supporting data.
* Data to support allocation method or formula.
* Notification list of all offset operators.
* Notification list of working, overriding, and royalty interests for uncommon interest cases.
* Any additional statements, data, or documents required to support commingling.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Elizabeth A. Casbeer TITLE Reg/Comp Analyst DATE 4-9-99

TYPE OR PRINT NAME Elizabeth A. Casbeer TELEPHONE NO. (915) 688-5570

WASHINGTON 33 STATE # 27
(Empire Abo Unit # H-312)



300 sxs 'H' RFC
circ. 30 sxs

DV @ 419'

ECP @465'

150 sxs 'H' RFC
100 sxsclass 'C'
no returns

hole in 5 1/2" @ 536'-602'
circ. cmt to surface w/ 225 sxs
9/21/98

8-5/8" 24# casing set @ 778'

60 holes 2468'-3030' 9/17/98
Fraced w/ 122,000# Brady
& 26,000# RC

900 sxs Howco lite
100 sxs class 'C'
TOC 550' by CBL

DV tool @ 3978'

335 sxs Howco lite
220 sxs Thickset
circ. 100sxs

Dumped 35' cmt no top 8/7/98
CIBP @ 6042' set 6/20/91

6058 to 6072' shot 10/25/78

CIBP @ 6110' set 10/25/78

6150 to 6170' shot 9/25/78

Cmt. Ret. @ 6215' set 10/9/78
6221 to 6227' shot 10/9/78 - sq w/ 125 sxs 10/9/78

Cmt. Ret @ 6238' set 9/21/78

6261 to 6281' shot 9/15/78 - sq w/ 150 sxs 9/21/78

5-1/2" 15.5# casing set @ 6405'

Submit to Appropriate District Office
State Lease - 6 copies
Fee Lease - 5 copies

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

2040 Pacheco St.
Santa Fe, NM 87505

Form C-105
Revised 1-1-89

WELL API NO. 30-015-22605

5. Indicate Type Of Lease STATE [X] FEE [ ]

6. State Oil & Gas Lease No.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

1a. Type of Well: OIL WELL [X] GAS WELL [ ] DRY [ ] OTHER

b. Type of Completion: NEW WELL [ ] WORK OVER [ ] DEEPEN [ ] PLUG BACK [X] DIFF RESVR [ ] OTHER

7. Lease Name or Unit Agreement Name: Washington 33 State

2. Name of Operator: ARCO Permian

8. Well No.: 27

3. Address of Operator: P.O. Box 1089 Eunice, NM 88231

9. Pool name or Wildcat: Artesia Queen Grayburg San Andres

4. Well Location
Unit Letter O : 815 Feet From The S Line and 2525 Feet From The E Line
Section 33 Township 17S Range 28E NMPM ~~Lea~~ Eddy County

10. Date Spudded	11. Date T.D. Reached	12. Date Compl.(Ready to Prod.)	13. Elevations(DF & RKB, RT, GR, etc.)	14. Elev. Casinghead
		09/28/98	3665' GL	

15. Total Depth	16. Plug Back T.D.	17. If Multiple Compl. How Many Zones?	18. Intervals Drilled By	Rotary Tools	Cable Tools
6405	6019				

19. Producing Interval(s), of this completion - Top, Bottom, Name: 2468-3032' San Andres

20. Was Directional Survey Made:

21. Type Electric and Other Logs Run: CPNL

22. Was Well Cored:

23. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8-5/8	24	778		circ	
5-1/2	15.5	6405		550 sx. surf	

24. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

25. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2-7/8	2496	

26. Perforation record (interval, size, and number)
2468-3032', 1 SPI, 60 holes

27. ACID, SHOT, FRACTURE, CEMENT, SQEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
See Attached Deta	

28. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping - Size and type pump)	Well Status (Prod. or Shut-in)
10/07/98	pumping	producing

Date of Test	Hours Tested	Choke Size	Prod'n For Test Period	Oil - Bbl.	Gas - MCF	Water - Bbl.	Gas - Oil Ratio
10/10/98	24			81	45	169	556

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API -(Corr.)
60	60					

29. Disposition of Gas (Sold, used for fuel, vented, etc.): sold

Test Witnessed By:

30. List Attachments: CPNL

31. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief

Signature Kellie D. Murrish Printed Name Kellie D. Murrish Title Admin. Asst. Date 10/22/98

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drill or deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all spec tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, tru vertical depths shall also be reported. For multiple completions, Items 25 through 29 shall be reported for each zone. The form is to b filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico		Northeastern New Mexico	
T. Anhy	T. Canyon	T. Ojo Alamo	T. Penn. "B"
T. Salt	T. Strawn	T. Kirtland-Fruitland	T. Penn. "C"
B. Salt	T. Atoka	T. Pictured Cliffs	T. Penn. "D"
T. Yates	T. Miss	T. Cliff House	T. Leadville
T. 7 Rivers	T. Devonian	T. Menefee	T. Madison
T. Queen	T. Silurian	T. Point Lookout	T. Elbert
T. Grayburg	T. Montoya	T. Mancos	T. McCracken
T. San Andres	T. Simpson	T. Gallup	T. Ignacio Otzte
T. Glorieta	T. McKee	Base Greenhorn	T. Granite
T. Paddock	T. Ellenburger	T. Dakota	T.
T. Blinebry	T. Gr. Wash	T. Morrison	T.
T. Tubb	T. Delaware Sand	T. Todilto	T.
T. Drinkard	T. Bone Springs	T. Entrada	T.
T. Abo	T.	T. Wingate	T.
T. Wolfcamp	T.	T. Chinle	T.
T. Penn	T.	T. Permain	T.
T. Cisco (Bough C)	T.	T. Penn "A"	T.

OIL OR GAS SANDS OR ZONES

No. 1, from ..... to ..... No. 3, from ..... to .....

No. 2, from ..... to ..... No. 4, from ..... to .....

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from ..... to ..... feet .....

No. 2, from ..... to ..... feet .....

No. 3. from ..... to ..... feet .....

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	To	Thickness in Feet	Lithology	From	To	Thickness in Feet	Lithology

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-22605		ARTESIA (Q-G-SA)

Property Code	Property Name	Well Number
22954	WASHINGTON 33 STATE	27

OGRID No.	Operator Name	Elevation
000990	ARCO PERMIAN	3665'

Surface Location

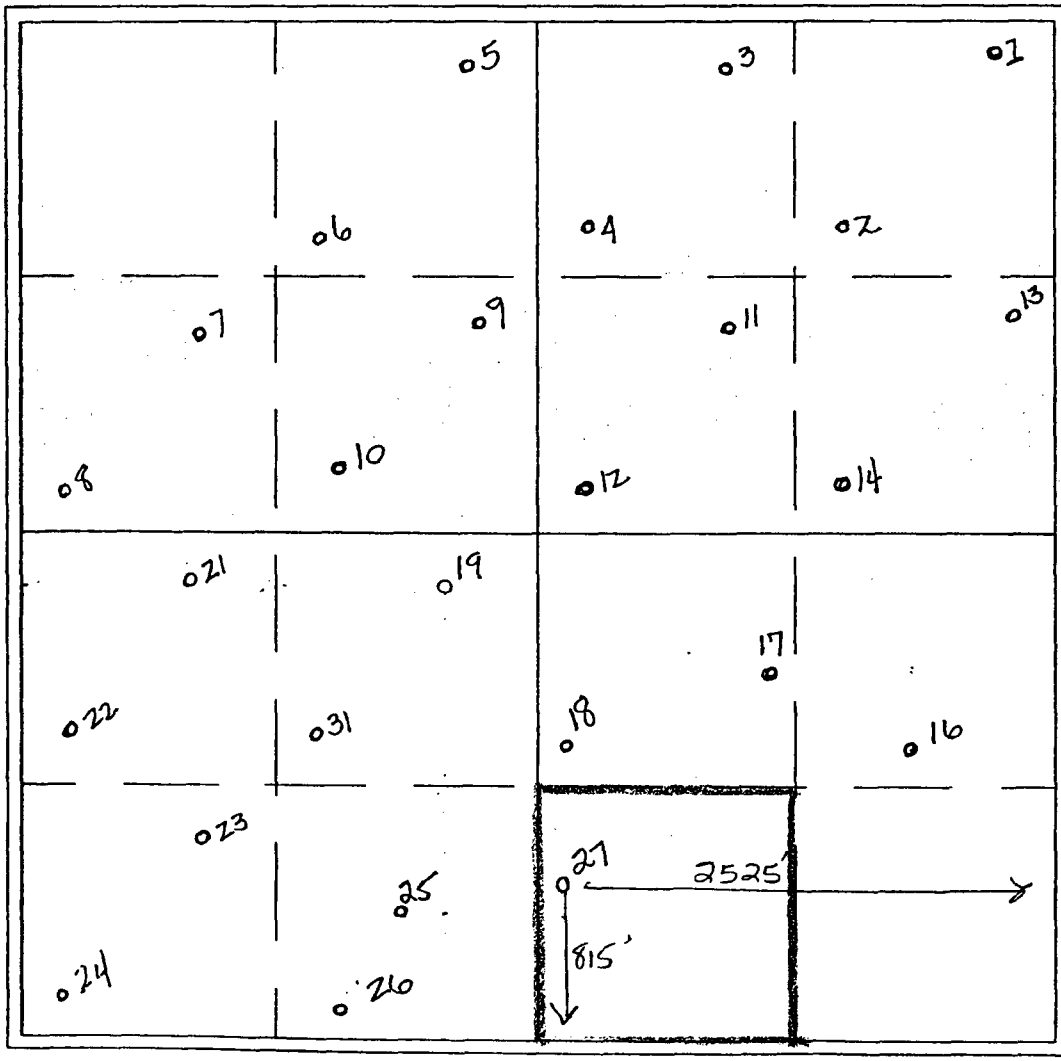
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	33	17 S	28 E		815	SOUTH	2525	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
40			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Signature

ELIZABETH A. CASBEER
Printed Name

REG / COMP. ANALYST
Title

6/3/98
Date

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervison, and that the same is true and correct to the best of my belief.

MARCH 3, 1998
Date Surveyed DMCC

Signature & Seal of Professional Surveyor

RONALD J. EIDSON NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR

3239 5-4-98
98-11-0358

Certificate No. RONALD J. EIDSON 3239
GARY EIDSON 12641
JASON McDONALD 12185

Washington State "33" No. 27

Allocation Formula

Well Name	Producing Formation	Daily Production Test (3 mo. Avg. Nov, Dec. 98', Jan. 99')	% of Total
Washington State "33" No. 24	Artesia (Glorieta, Yeso)	29 BO/61 MCF/84 BW	72.5 %
Washington State "33" No. 25	Artesia (Queen, Grayburg, SA)	11 BO/57 MCF/41 BW	27.5 %

The above production test represents stable production from a San Andres producer (Washington State "33" No. 25) and a Yeso producer (Washington State "33" No. 24) . We believe these rates of production represent an acceptable means to allocate production. See attached production plots.

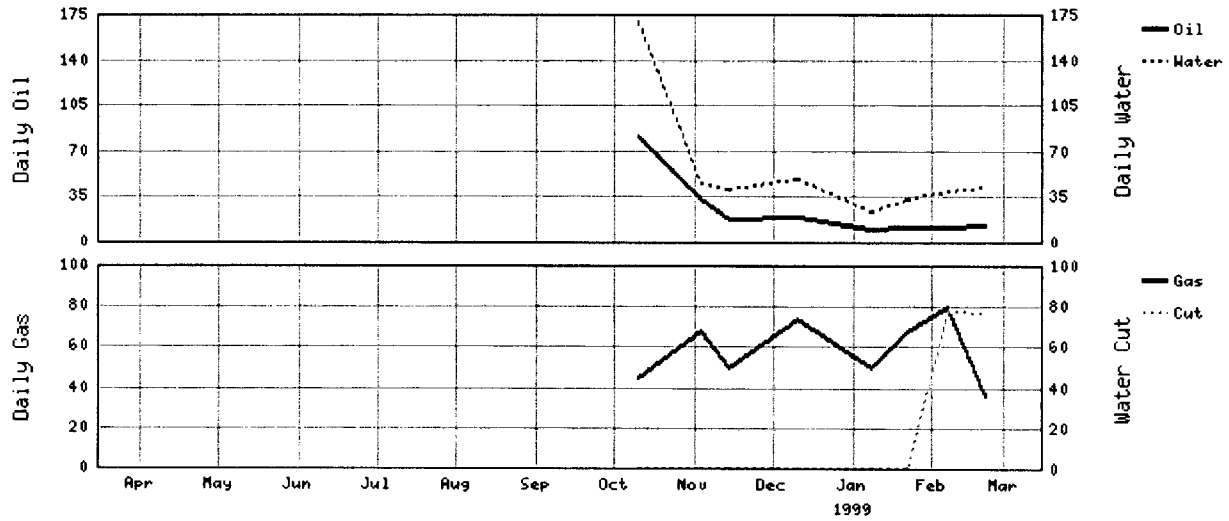
ARCO Permian

Mon Mar 15, 1999
3:09:48 PM

Well Test Data for SE NEW MEXICO: ARTESIA: QUEEN GRAYBURG SAN ANDRES
WASHINGTON 33 STATE #27 - 300152260500 - PO - AC

Prod Down Inject

Date	Oil	Water	Gas	Cut	Fl_Pd	%C02	GasGr	GDur
02/22/1999	13	42	36	76	0	0.000	0	0
02/07/1999	11	38	79	78	0	0.000	0	0
01/22/1999	11	33	67	0	0	0.000	0	0
01/08/1999	9	24	50	0	0	0.000	0	0
12/11/1998	19	48	73	0	0	0.000	0	0
11/14/1998	17	40	50	0	0	0.000	0	0
11/03/1998	32	45	67	0	0	0.000	0	0
10/10/1998	81	169	45	0	0	0.000	0	0
Average:	24	55	58	19	0	0.000	0	0



Prod Down Inject

execution time = 3 seconds

For questions or comments regarding this program, contact pagemaster@permian.arco.com

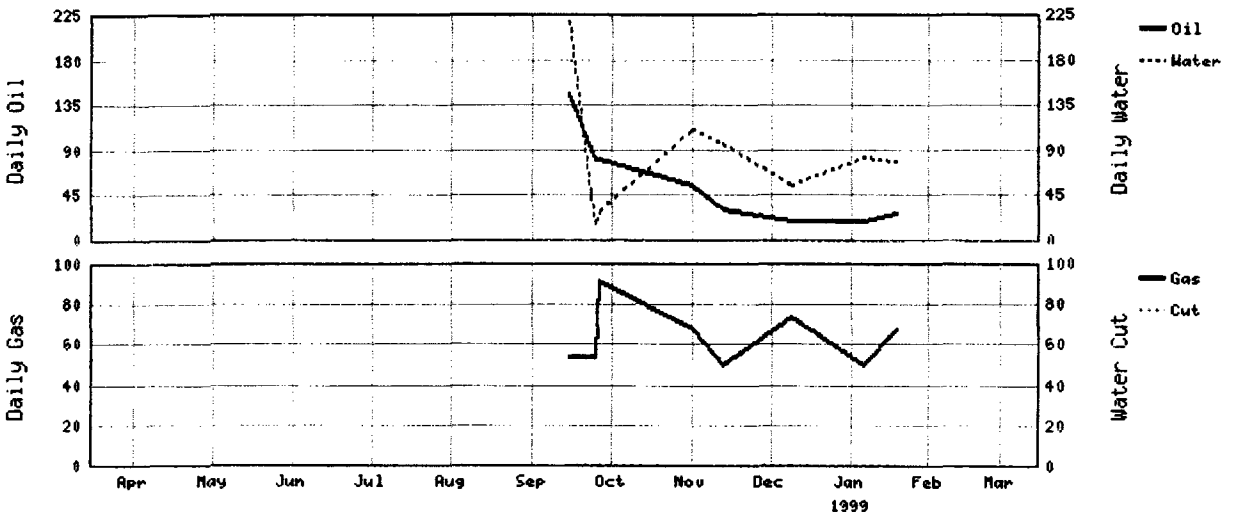
ARCO Permian

Mon Mar 15, 1999
3:08:12 PM

Well Test Data for SE NEW MEXICO: ARTESIA: YESO
WASHINGTON 33 STATE #24 - 300153033400 - PO - AC

Prod Down Inject

Date	Oil	Water	Gas	Cut	Fl_Pd	%C02	GasGr	GDur
01/19/1999	26	78	67	0	0	0.000	0	0
01/06/1999	18	82	50	0	0	0.000	0	0
12/09/1998	18	53	73	0	0	0.000	0	0
11/13/1998	29	96	50	0	0	0.000	0	0
11/01/1998	54	109	67	0	0	0.000	0	0
09/26/1998	80	27	91	0	0	0.000	0	0
09/25/1998	80	15	53	0	0	0.000	0	0
09/15/1998	146	218	53	0	0	0.000	0	0
Average:	56	85	63	0	0	0.000	0	0



Prod Down Inject

execution time = 2 seconds

For questions or comments regarding this program, contact pagemaster@permian.arco.com

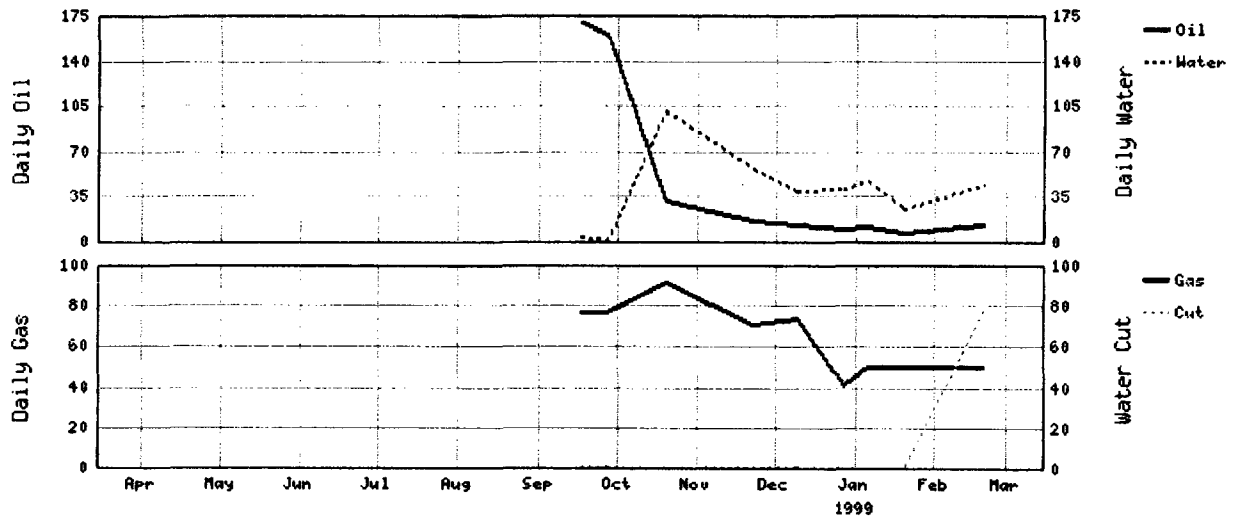
ARCO Permian

Mon Mar 15, 1999
3:06:54 PM

Well Test Data for SE NEW MEXICO: ARTESIA: QUEEN GRAYBURG SAN ANDRES
WASHINGTON 33 STATE #25 - 300150169000 - PO - AC

Prod Down Inject

Date	Oil	Water	Gas	Cut	Fl_Pd	%C02	GasGr	GDur
02/20/1999	13	43	50	77	0	0.000	0	0
01/20/1999	6	25	50	0	0	0.000	0	0
01/06/1999	11	46	50	0	0	0.000	0	0
12/28/1998	10	40	41	0	0	0.000	0	0
12/10/1998	12	39	73	0	0	0.000	0	0
11/23/1998	16	56	70	0	0	0.000	0	0
10/20/1998	31	100	91	0	0	0.000	0	0
09/27/1998	160	0	76	0	0	0.000	0	0
09/17/1998	169	3	76	0	0	0.000	0	0
Average:	48	39	64	9	0	0.000	0	0



Prod Down Inject

execution time = 9 seconds

For questions or comments regarding this program, contact pagemaster@permian.arco.com

Water Analysis Report by Baker Petrolite

ARCO
WASHINGTON 33
WELL # 24
WELLHEAD

YESO

Account Manager
STEVE THOMAS

Summary	
Sampling Date	2/18/99
Analysis Date	2/24/99
Analyst	JOANNA RAGAN
TDS (mg/l or g/m³)	206471
Density (g/cm³ or tonne/m³)	1.136
Anion/Cation Ratio	1.00
Carbon Dioxide	
Oxygen	

Analysis of Sample 108815 @ 75°F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride	121426	3425	**Sodium**	77942	339(
Bicarbonate	444	7.28	**Magnesium**	425	35.(
Carbonate	0.00	0.00	**Calcium**	1698	84.7
Sulfate	4174	86.9	**Strontium**	36.0	0.8
Phosphate	N/A	N/A	**Barium**	0.40	0.0
Borate	N/A	N/A	**Iron**	2.00	0.0
Silicate	N/A	N/A	Potassium	324	8.2
			Aluminum	N/A	N/A
			Chromium	N/A	N/A
			Copper	N/A	N/A
pH at time of sampling			Lead	N/A	N/A
pH at time of analysis		7.33	Manganese	N/A	N/A
pH used in Calculations		7.33	Nickel	N/A	N/A

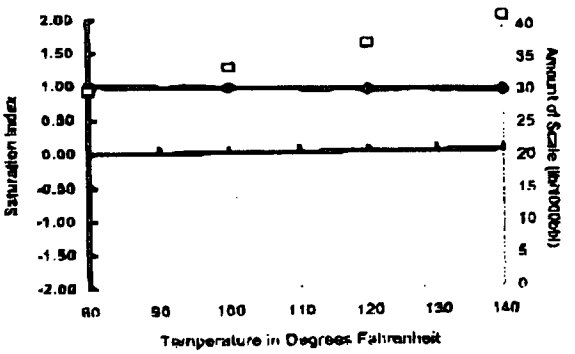
Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000bbl									
Temp.	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press.
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0.	1.01	30.7	-0.18		-0.15		-0.22		0.94	0.19	0.1
100	0.	0.95	34.2	-0.27		-0.17		-0.26		0.73	0.17	0.2
120	0.	0.91	37.8	-0.34		-0.17		-0.28		0.54	0.15	0.4
140	0.	0.87	41.8	-0.41		-0.14		-0.29		0.38	0.12	0.6

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.
Note 3: The reported CO_2 pressure is actually the calculated CO_2 fugacity. It is usually nearly the same as the CO_2 partial pressure

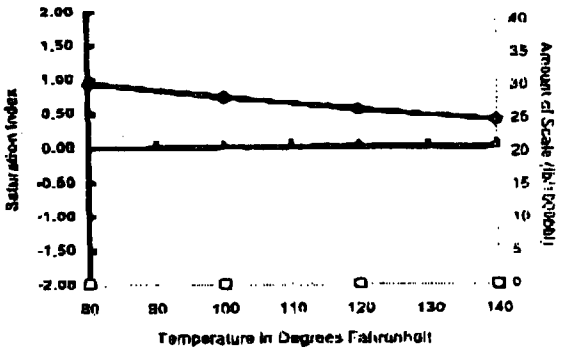
Scale Predictions from Baker Petrolite

Analysis of Sample 108815 @ 75°F for ARCO , Feb/24/99

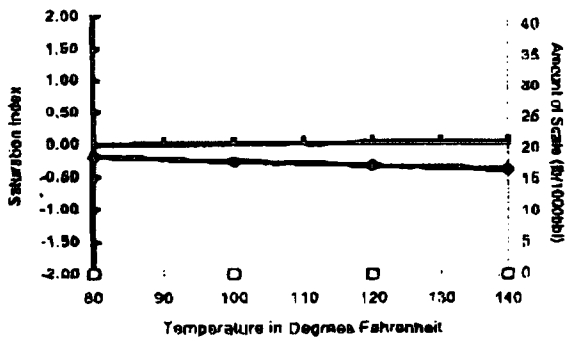
Calcite - $CaCO_3$



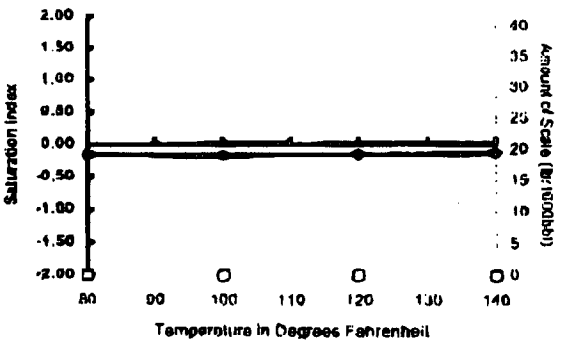
Barite - $BaSO_4$



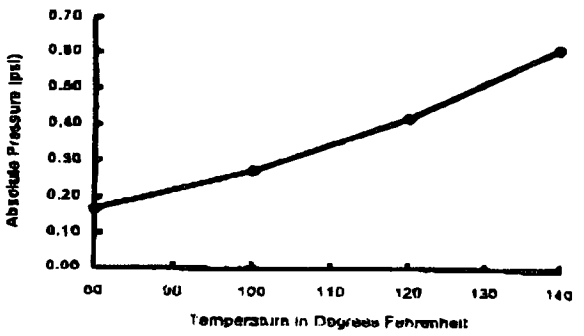
Gypsum - $CaSO_4 \cdot 2H_2O$



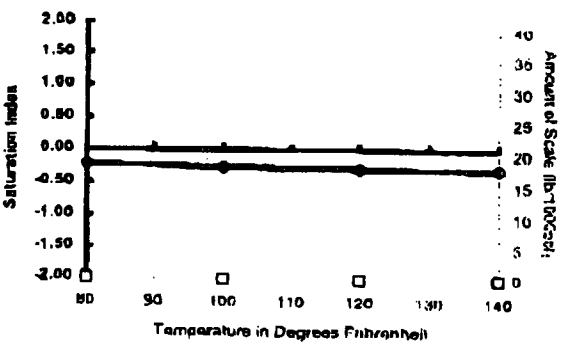
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



Water Analysis Report by Baker Petrolite

ARCO
WASHINGTON 33
WELL # 25
WELLHEAD

SAN ANDRES

Account Manager
STEVE THOMAS

Summary	
Sampling Date	2/18/99
Analysis Date	2/24/99
Analyst	JOANNA RAGAN
TDS (mg/l or g/m³)	181974
Density (g/cm³ or tonne/m³)	1.120
Anion/Cation Ratio	1.00
Carbon Dioxide	
Oxygen	

Analysis of Sample 108814 @ 75°F					
Anions	**mg/l**	**meq/l**	**Cations**	**mg/l**	**meq/l**
Chloride	106506	3004	**Sodium**	67398	293
Bicarbonate	714	11.7	**Magnesium**	565	46.5
Carbonate	0.00	0.00	**Calcium**	2187	109
Sulfate	4076	84.9	**Strontium**	45.0	1.03
Phosphate	N/A	N/A	**Barium**	0.10	0.00
Borate	N/A	N/A	**Iron**	8.00	0.29
Silicate	N/A	N/A	Potassium	475	12.
			Aluminum	N/A	N/A
			Chromium	N/A	N/A
			Copper	N/A	N/A
pH at time of sampling			Lead	N/A	N/A
pH at time of analysis		7.02	Manganese	N/A	N/A
pH used in Calculations		7.02	Nickel	N/A	N/A

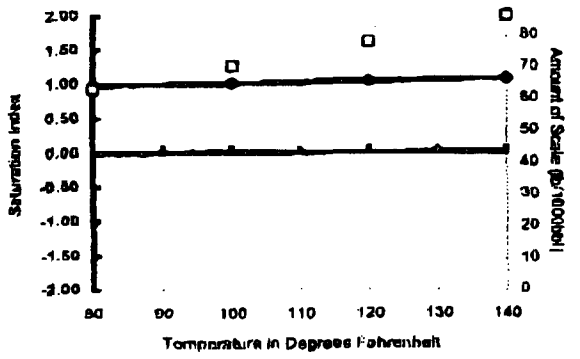
Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000bbl										CO_2
Temp.	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		Press.
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	ps
80	0.	0.98	63.6	-0.09		-0.07		-0.10		0.36	0.03	0.5
100	0.	1.01	70.8	-0.16		-0.08		-0.13		0.16	0.02	0.7
120	0.	1.03	78.3	-0.23		-0.07		-0.15		-0.02		0.9
140	0.	1.05	86.2	-0.29		-0.03		-0.16		-0.18		1.3

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.
Note 3: The reported CO_2 pressure is actually the calculated CO_2 fugacity. It is usually nearly the same as the CO_2 partial pressure.

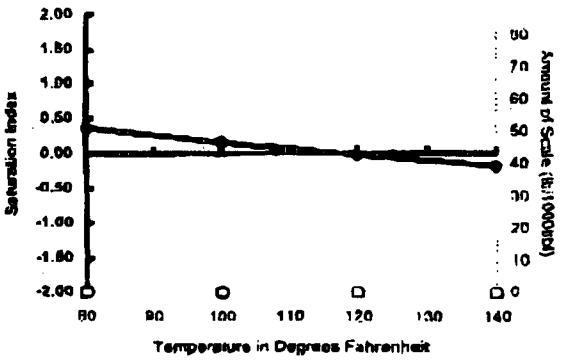
Scale Predictions from Baker Petrolite

Analysis of Sample 108814 @ 75°F for ARCO , Feb/24/99

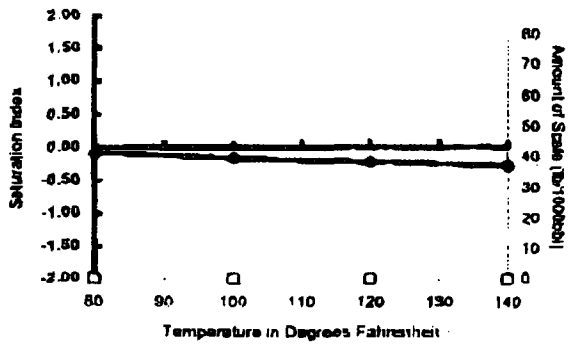
Calcite - $CaCO_3$



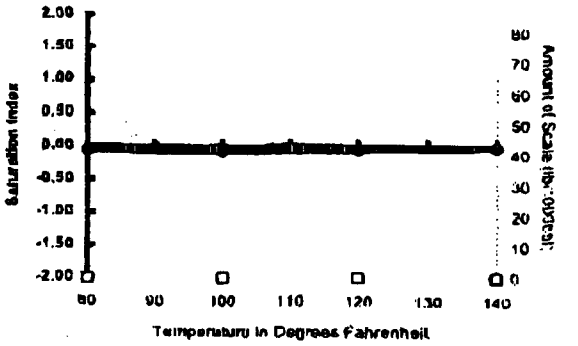
Barite - $BaSO_4$



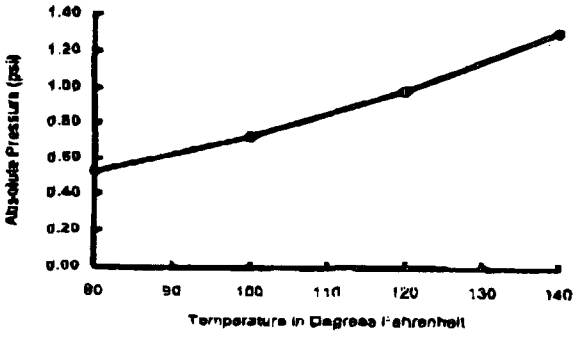
Gypsum - $CaSO_4 2H_2O$



Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$