ARCO Permian
PO Box 1089
Eunice NM 88231
Telephone 505 394 1600

Southeast New Mexico Asset Area

DHC 8/19/98

July 29, 1998

3086

David Catinak
State of New Mexico
Oil Conservation Commission
2040 S. Pacheco
Santa Fe, NM 87505

Dear Mr. Catinak:

ARCO Permian submits application for Administrative Approval of Rule 303 © of the Commission Rules and Regulations to permit the downhole commingling of the oil and gas produced from the Monument Tubb and the Northwest Skaggs Drinkard pools from the Dual completion of the J.H. Williams #2 located in S/2SE/4 of Section 34, T19S, R34E, Lea County, NM.

Gas sales from the Monument Tubb and Skaggs Drinkard pools will be metered together with a split based on a percentage of production by well testing methods. Based on 216 MCFPD avg produced from the Monument Tubb and 125 MCFPD avg produced from the NW Skaggs Drinkard a total of 63% will be allocated to the Monument Tubb gas production and a total of 37% will be allocated to the NW Skaggs Drinkard gas production. The total combined daily casinghead gas production of 355 MCF does not exceed the top allowable of 2220 MCFPD.

Oil sales from the Monument Tubb pool will be based on 29 BOPD avg production. Oil sales from the NW Skaggs Drinkard pool will be based on 91 BOPD avg production. A total of 24% will be allocated to the Monument Tubb oil production and a total of 76% will be allocated to the NW Skaggs Drinkard oil production. The total combined daily oil production of 128 BOPD does not exceed the top allowable of 222 BOPD.

Water analyses of both zones are very similar and no contamination is foreseeable. Analyses are attached for your review.

Attached for your consideration is detailed gravity data, a wellbore schematic, well location and acreage dedication plats for both the Monument Tubb and NW Skaggs Drinkard pools. The chart below estimates produced values of the liquid hydrocarbons for each pool.

Northwest Skaggs Drinkard	*91 BO*	*39.1 Grav*	*$12.48*
Monument Tubb	*29 BO*	*36.3*	*$12.42*
Combined Price per bbl	*120 BO*	*38.4*	*$12.46*

We believe that the downhole commingled production will not be devalued by commingling the two zones. Due to the amount of liquids and a declining bottom hole pressure it will be more efficient and productive to pump both zones maintaining no fluid level. This would increase production by an estimated 20%. Oil from both zones have high paraffin depositions and the current configuration does not allow treating these problems. Should you require additional information in order to approve this request, please do not hesitate to contact the undersigned at (505)394-1659.

Respectfully,

Larry D. Henson

Larry D. Henson
Area Operations Supervisor

LH\kdm

xc: Dave Newell – MIO 23
Chris Williams – NMOCD Hobbs

Enclosures

EXHIBIT "B" - CASE NO. 11353, ORDER NO. R-10470-A

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240
DISTRICT II
811 South First St., 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 S. Pacheco
Santa Fe, New Mexico 87505-6429

APPLICATION FOR DOWNHOLE COMMINGLING

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

APPROVAL PROCESS:
__ Administrative __ Hearing

EXISTING WELLBORE
__ YES __ NO

ARCO Permian (Operator) P.O. BOX 1089 (Address) Eunice, NM 88231

J.H. Williams (Lease) 2 (Well No.) P - Sec.34-T19S-R37E (Unit Ltr. - Sec - Twp - Rge) Lea (County)

OGRID NO. 000990 Property Code 020949 API NO. 30-025-34163 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 Zones	Lower Zone
1. Pool Name and Pool Code	Monument Tubb		NW Skaggs Drinkard
2. Top and Bottom of Pay Section (Perforations)	6418-6617'		6812-6904'
3. Type of production (Oil or Gas)	Oil		Oil
4. Method of Production (Flowing or Artificial Lift)	Flowing		Artificial Lift
5. Bottomhole Pressure Oil Zones - Artificial Lift: Estimated Current Gas & Oil - Flowing: Measured Current All Gas Zones: Estimated Or Measured Original	a. (Current) 1500	a.	a. 1600
	b. (Original)	b.	b.
6. Oil Gravity (°API) or Gas BTU Content	36.3		39.1
7. Producing or Shut-In?	Producing		Producing
Production Marginal? (yes or no)	Yes		Yes
* 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:	Date: Rates:	Date: Rates:
* If Producing, give date andoil/gas/ water rates of recent test (within 60 days)	Date: 06/09/98 Rates: 32BO, 2BW, 239MCF	Date: Rates:	Date: 06/09/98 Rates: 96BO, 10BW, 116MCF
8. Fixed Percentage Allocation Formula -% for each zone	Oil: 24 % Gas: 63 %	Oil: % Gas: %	Oil: 76 % Gas: 37 %

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. __ Yes X No

15. NMOCD Reference Cases for Rule 303(C) 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 Kellie D. Murrish TITLE Admin. Asst. DATE 07/10/98

TYPE OR PRINT NAME Kellie D. Murrish TELEPHONE NO. (505) 394-1649

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
811 S. 1st Street, Artesia, NM 88210-2834
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

Form C-102
Revised October 18, 1994
Instructions on back
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-34163	047090	MONUMENT TUBB

[4] Property Code	[5] Property Name	[6] Well Number
020949	J.H. WILLIAMS	2

[7] OGRID No.	[8] Operator Name	[9] Elevation
000990	ARCO Permian	3569' GR

[10] Surface Location

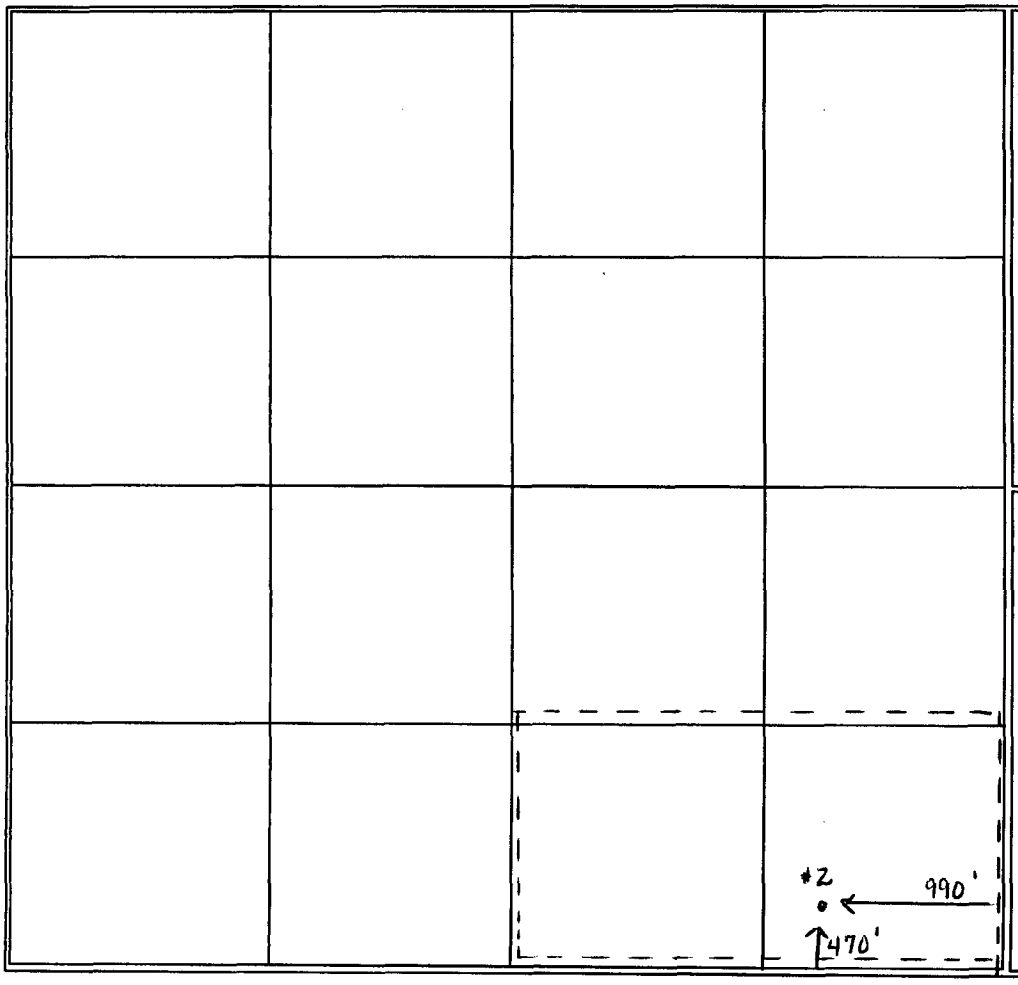
UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
P	34	19S	37E		470	S	990	E	LEA

[11] 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

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
80			SURFACE COMMINGLE ORDER PC-959

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



[17] OPERATOR CERTIFICATION

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

Signature
KELLIE D. MURRISH
Printed Name
ADMINISTRATIVE ASSISTANT
Title
07/02/98
Date

[18] 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 supervision, and that the same is true and correct to the best of my belief.

Date of Survey

Signature and Seal of Professional Surveyer:

Certificate Number

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
811 S. 1st Street, Artesia, NM 88210-2834
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

Form C-102
Revised October 18, 1994
Instructions on back
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-34163	96768	NORTHWEST SKAGGS DRINKARD

[4] Property Code	[5] Property Name	[6] Well Number
020949	J.H. WILLIAMS	2

[7] OGRID No.	[8] Operator Name	[9] Elevation
000990	ARCO Permian	3569' GR

[10] Surface Location

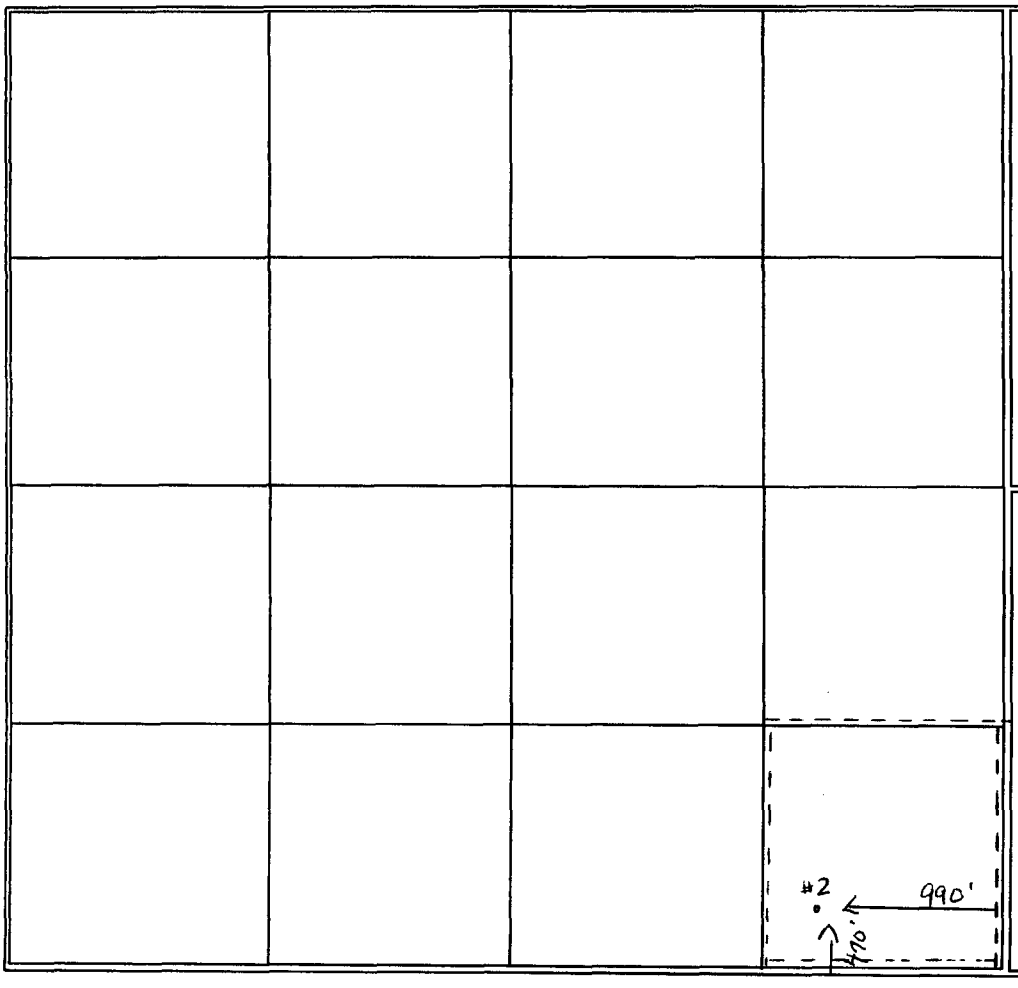
UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
P	34	19S	37E		470	S	990	E	LEA

[11] 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

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
40			SURFACE COMMINGLE ORDER PC-959

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



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

Signature
KELLIE D. MURRISH
Printed Name
ADMINISTRATIVE ASSISTANT
Title
07/02/98
Date

[18] 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 supervision, and that the same is true and correct to the best of my belief.

Date of Survey

Signature and Seal of Professional Surveyer:

Certificate Number

ARCO Permian
600 N Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688-5672

January 15, 1998

State of New Mexico
Oil Conservation Commission
2040 East Pacheco
Santa Fe, New Mexico 87505

Attention: Mr. Ben Stone

Re: J. H. Williams #1 Well (660' FSL, 1980' FEL)
J. H. Williams #2 Well (470' FSL, 990' FEL)
Township 19 South, Range ~~34~~ 37 East
Section 34: S/2 SE/4
Lea County, New Mexico

Dear Sirs:

ARCO Permian submitted an application to permit surface commingling of the oil produced from the referenced wells. (Copy of letter dated 12/9/97 enclosed). Our Division Order Title Opinion shows common ownership (royalty and working interest) below the base of the San Andres formation.

Very truly yours,

Lee M. Scarborough
Land Director, SE New Mexico

LMS/sb

xc: Chris Williams
State of New Mexico
Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico 88240

~~Kellie Murrish~~
ARCO Permian
P. O. Box 1089
Eunice, New Mexico 88231

ARCO Permian
PO Box 1089
Eunice NM 88231
Telephone 505 394 1600

Southeast New Mexico Asset Area

July 14, 1998

Amerada Hess Corp.
P.O. Box 2040
Tulsa, OK 74102-2040

Chevron USA Inc.
P.O. Box 1150
Midland, TX 79702-1150

Nelson Limited Partnership
P.O. Box 2432
Hobbs, NM 88241-2432

Powder Horn Investments, Inc.
P.O. Box 5208
Hobbs, NM 88241-5208

Barton Veteto
607 Abo
Hobbs, NM 88240

Mark Veteto
P.O. Box 2070
Hobbs, NM 88241

Charlie R & Jalee Smith Living Trust
P.O. Box 159
Hobbs, NM 88241-0159

Saracen Investments
P.O. Box 2070
Hobbs, NM 88241-2070

MSC Investments, Inc.
P.O. Box 6011
Hobbs, NM 88241-6011

Lewis B. Burleson Trust
P.O. Box 2479
Midland, TX 79702-2479

The Craig Family Trust
c/o Weldon Craig, Trustee
P.O. Box 5526
Hobbs, NM 88241-5526

E.R. Taylor
P.O. Box 1461
Hobbs, NM 88240

Two-State Tank Rental Co.
P.O. Box 2305
Hobbs, NM 88240-2305

Mike & Georgia McDermett
P.O. Box 2040
Hobbs, NM 88240-2040

Southwest Supply Ltd.
P.O. Box 2248
Hobbs, NM 88241-2248

Michael L. Pierce
7707 Plain Field Drive
Hobbs, NM 88240

NM Tex Oil & Gas Inc.
P.O. Box 2070
Hobbs, NM 88241-2070

Watson Truck & Supply, Inc.
P.O. Box 10
Hobbs, NM 88241-0010

Barry A. Peters
P.O. Box 5208
Hobbs, NM 88241-5209

C.A. Slater
P.O. Box 2305
Hobbs, NM 88240-2305

RE: Application for ARCO Permian
For Exception to State Rule 303 © on
J.H. Williams #2
Lea County, New Mexico

Gentlemen:

ARCO Permian has applied with the New Mexico Oil Conservation Commission requesting an Exception to State Rule 303 © to downhole commingle the J.H. Williams #2 lease located in Lea County, NM. The attachments are for your records.

If you have any questions in regards to this notice please contact me at (505)394-1649.

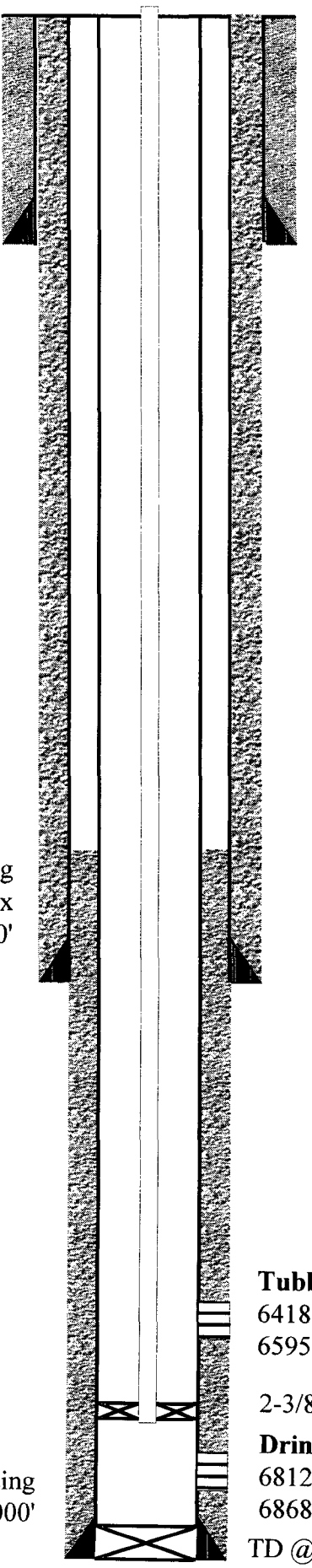
Yours truly,

Kellie D. Murrish
Administrative Assistant

Attachments

Xc: File

WELLBORE SCHEMATIC



J. H. Williams No. 2

470' FSL & 990' FEL
Sec. 34, T-19S, R-37E, Lea County, NM
API: 30-025-34163
Spudded: 10/26/97
Completed: 12/30/97

KB: 3579' **GL: 3569'**

9-5/8" 36# Surface Casing
Cmt to /Surf. w/ 660 sx
Shoe @ 1241'

7" 23# Casing
Cmt to /Surf. w/ 650 sx
Shoe @ 4030'

Tubb Perforations
6418'-21', 6479'-82', 6508'-31',
6595'-99', 6607'-10', 6614'-17' (2 spf)

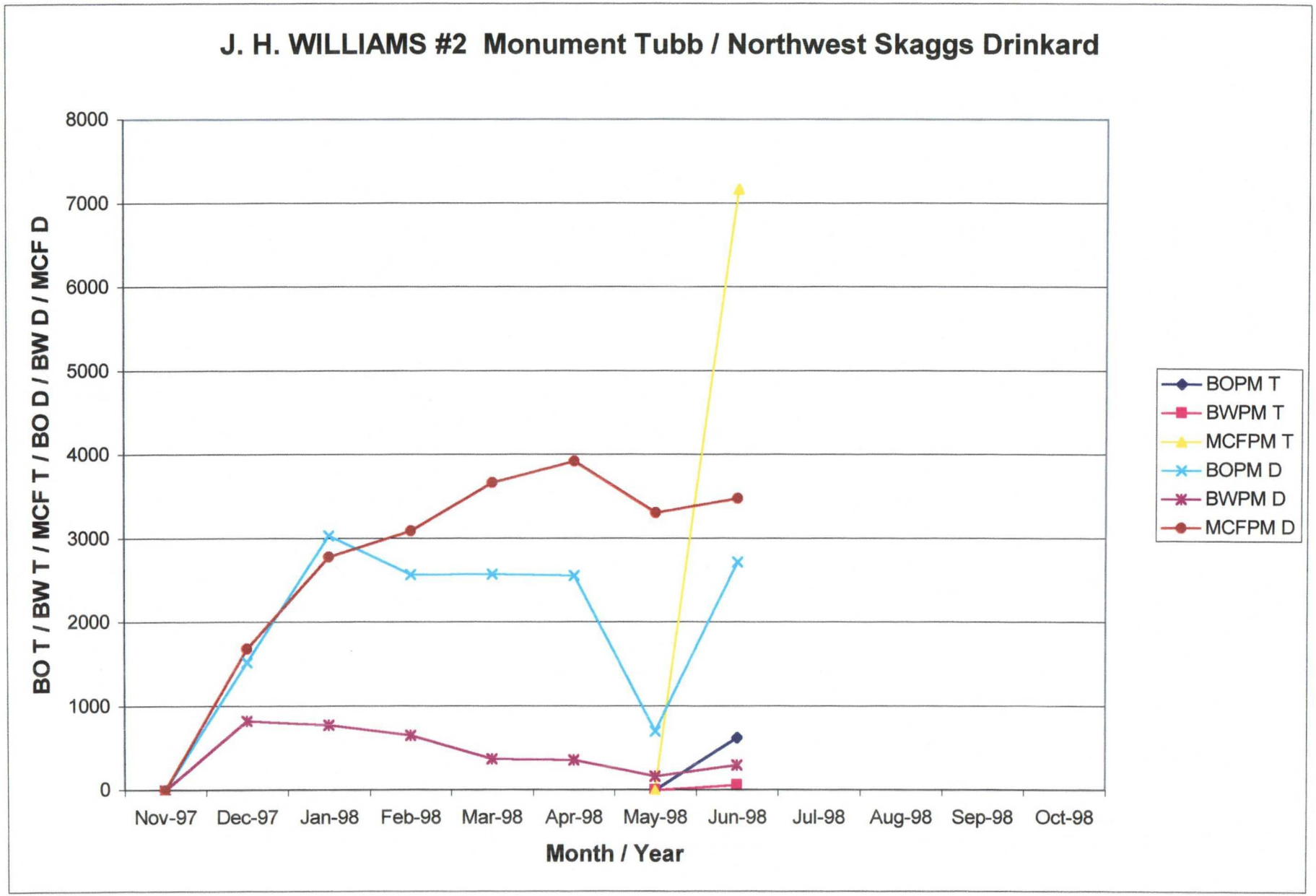
2-3/8" tbg w/Pkr @ 6652'

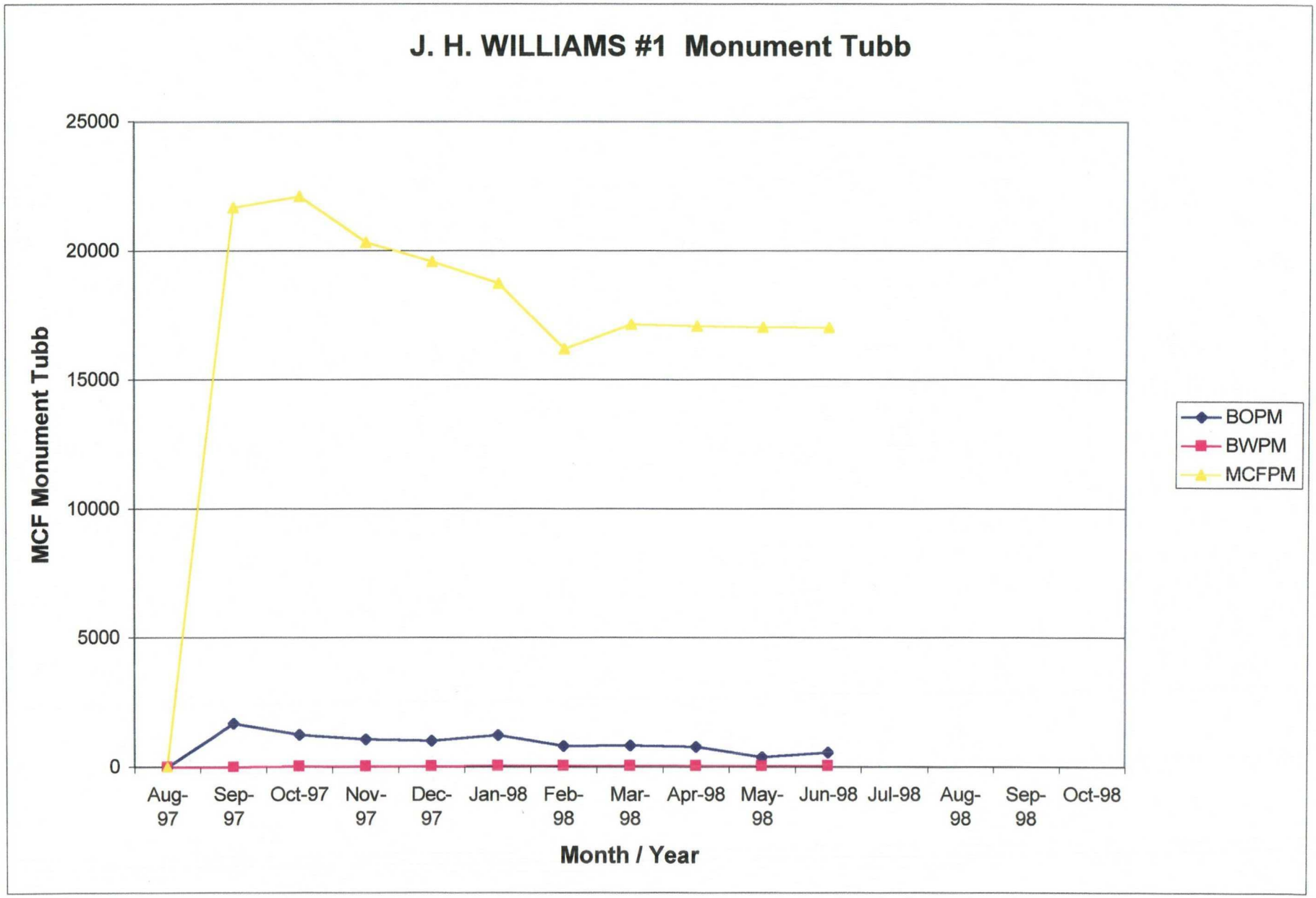
Drinkard Perforations
6812'-22, 6825'-29', 6845'-62',
6868'-82', 6895'-6904' (2 spf)

4-1/2" 15.5# Production Casing
Cement 665 sx, Shoe @ 7000'

TD @ 7000' PBTD @ 6980'

DLK 02-03-98


J. H. WILLIAMS #2 Monument Tubb / Northwest Skaggs Drinkard
BO T / BW T / MCF T / BO D / BW D / MCF D
8000
7000
6000
5000
4000
3000
2000
1000
0
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
May-98
Jun-98
Jul-98
Aug-98
Sep-98
Oct-98
Month / Year
BOPM T
BWPM T
MCFPM T
BOPM D
BWPM D
MCFPM D


J. H. WILLIAMS #1 Monument Tubb
MCF Monument Tubb
25000
20000
15000
10000
5000
0
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Jan-98
Feb-98
Mar-98
Apr-98
May-98
Jun-98
Jul-98
Aug-98
Sep-98
Oct-98
Month / Year
BOPM
BWPM
MCFPM

Laboratory Services, Inc.
1331 Tasker Drive
Hobbs, New Mexico 88240
Telephone: (505) 397-3713

SULFUR IN CRUDE OIL

ARCO Permian
Attention: Mr. Rolland Taylor
P. O. Box 1069
Eunice, New Mexico 88231

Jul 2, 1998

	Sulfur	API Gravity @ 60° F	Specific Gravity @ 60° F
J. H. Williams #1	0.4395 wt. %	37.8	0.8358
J. H. Williams #2 Tubb	0.3973 wt. %	36.3	0.8433
J. H. Williams #2 Drinkard	0.3475 wt. %	39.1	0.8294

Thank You,
Rolland Perry

Circ: Bmatthei
CF

BAKER PETROLITE
A Baker Hughes company

Water Analysis Report by Baker Petrolite

ARCO PERMIAN

J. H. WILLIAMS
WELL #2
SOUTH SEPARATOR - UPPER ZONE

Account Manager
RON MATTHEWS

Summary	
Sampling Date	7/10/98
Analysis Date	7/16/98
Analyst	SHEILA DEARMAN
TDS (mg/l or g/m³)	282877
Density (g/cm³ or tonne/m³)	1.190
Anion/Cation Ratio	1.00
Carbon Dioxide	220 PPM
Oxygen	

Analysis of Sample 106548 @ 75°F					
Anions	**mg/l**	**meq/l**	**Cations**	**mg/l**	**meq/l**
Chloride	**168745**	**4760**	**Sodium**	**104922**	**4564**
Bicarbonate	**24.0**	**0.39**	**Magnesium**	**2321**	**191**
Carbonate	**0.00**	**0.00**	**Calcium**	**1041**	**51.9**
Sulfate	**4322**	**90.0**	**Strontium**	**20.0**	**0.46**
Phosphate	N/A	N/A	**Barium**	**0.20**	**0.00**
Borate	N/A	N/A	**Iron**	**471**	**16.9**
Silicate	N/A	N/A	Potassium	1011	25.9
			Aluminum	N/A	N/A
Hydrogen Sulfide		20 PPM	Chromium	N/A	N/A
			Copper	N/A	N/A
pH at time of sampling		5.40	Lead	N/A	N/A
pH at time of analysis			Manganese	N/A	N/A
pH used in Calculations		**5.40**	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.	-2.17		-0.36		-0.29		-0.58		0.54	0.07	0.73
100	0.	-2.10		-0.46		-0.33		-0.62		0.32	0.05	0.85
120	0.	-2.03		-0.55		-0.34		-0.64		0.13	0.03	0.97
140	0.	-1.95		-0.64		-0.33		-0.66		-0.04		1.06

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.

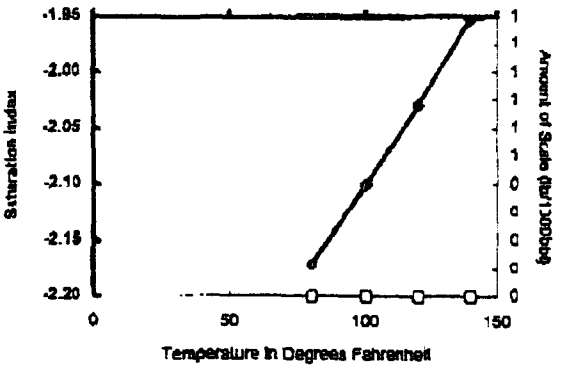
Note 3: The reported CO_2 pressure is actually the calculated CO_2 fugacity. It is usually nearly the same as the CO_2 partial pressure.

BAKER PETROLITE
A Baker Hughes company

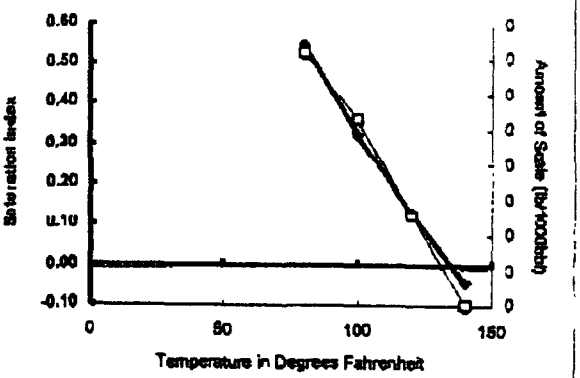
Scale Predictions from Baker Petrolite

Analysis of Sample 100546 @ 75°F for ARCO PERMIAN , Jul/16/08

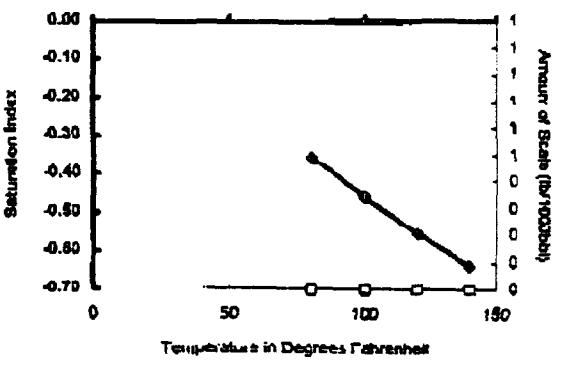
Calcite - $CaCO_3$



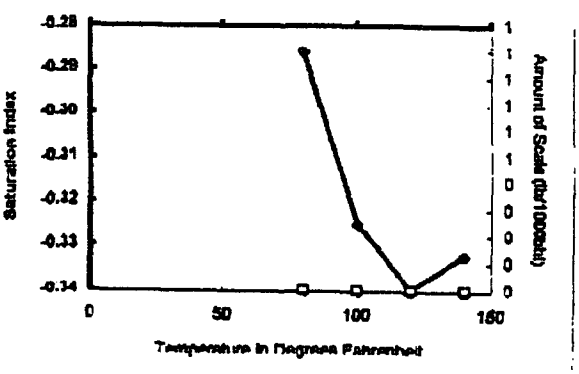
Barite - $BaSO_4$



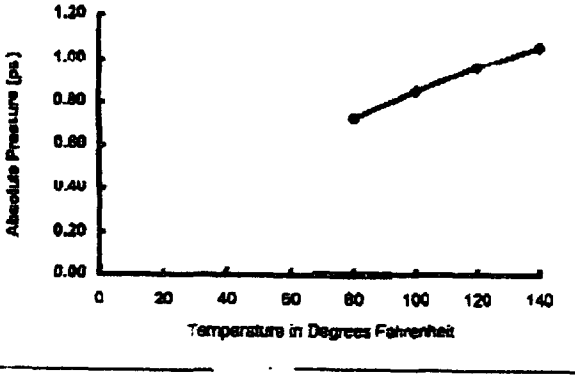
Gypsum - $CaSO_4 \cdot 2H_2O$



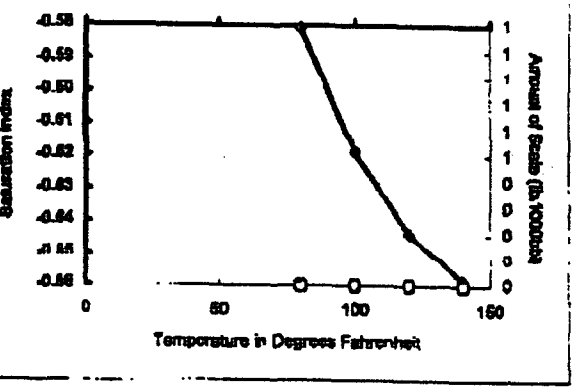
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



BAKER PETROLITE
A Baker Hughes company

Water Analysis Report by Baker Petrolite

ARCO PERMIAN

J. H. WILLIAMS
WELL #2
NORTH SEPARATOR - LOWER ZONE

Account Manager
RON MATTHEWS

Summary	
Sampling Date	7/10/98
Analysis Date	7/16/98
Analyst	SHEILA DEARMAN
TDS (mg/l or g/m³)	230729
Density (g/cm³ or tonne/m³)	1.161
Anion/Cation Ratio	1.00
Carbon Dioxide	1050 PPM
Oxygen	

Analysis of Sample 106549 @ 75°F					
Anions	**mg/l**	**meq/l**	**Cations**	**mg/l**	**meq/l**
Chloride	144588	4078	**Sodium**	61945	2694
Bicarbonate	256	4.20	**Magnesium**	8968	738
Carbonate	0.00	0.00	**Calcium**	12504	625
Sulfate	967	20.1	**Strontium**	30.0	0.68
Phosphate	N/A	N/A	**Barium**	0.70	0.01
Borate	N/A	N/A	**Iron**	591	21.2
Silicate	N/A	N/A	**Potassium**	800	20.5
			Aluminum	N/A	N/A
Hydrogen Sulfide		40 PPM	**Chromium**	N/A	N/A
			Copper	N/A	N/A
pH at time of sampling		5.60	**Lead**	N/A	N/A
pH at time of analysis			**Manganese**	N/A	N/A
pH used in Calculations		5.60	**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	psi
80	0.	-0.18		-0.05		-0.02		-1.04		0.42	0.22	3.78
100	0.	-0.09		-0.12		-0.02		-1.06		0.23	0.15	4.57
120	0.	0.01	0.51	-0.17		0.01	5.55	-1.07		0.06	0.05	5.34
140	0.	0.11	6.10	-0.22		0.05	46.4	-1.07		-0.08		6.05

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.

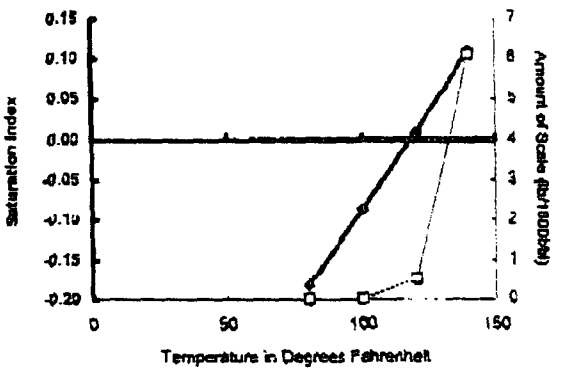
Note 3: The reported CO_2 pressure is actually the calculated CO_2 fugacity. It is usually nearly the same as the CO_2 partial pressure.

BAKER PETROLITE
A Baker Hughes company

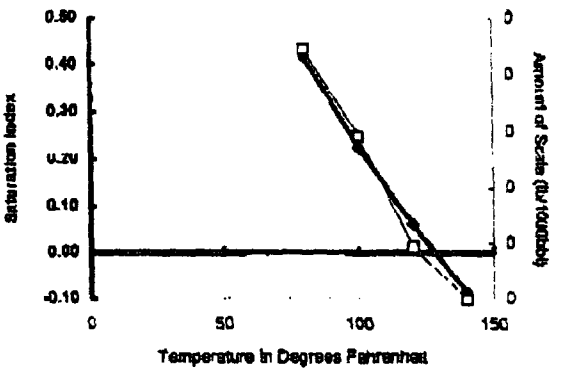
Scale Predictions from Baker Petrolite

Analysis of Sample 106549 @ 75°F for ARCO PERMIAN , Jul/16/98

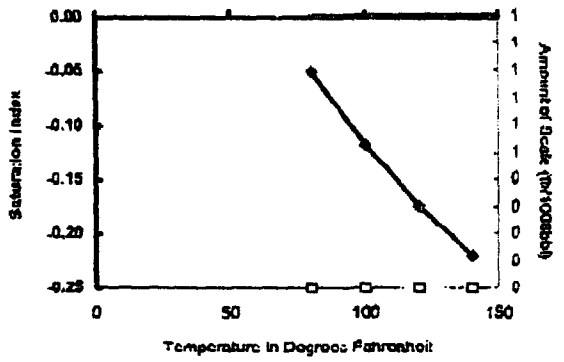
Calcite - $CaCO_3$



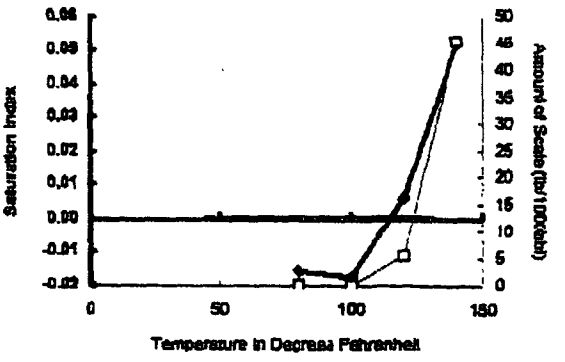
Barite - $BaSO_4$



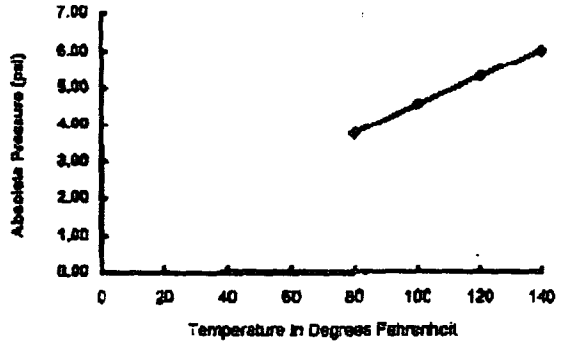
Gypsum - $CaSO_4 \cdot 2H_2O$



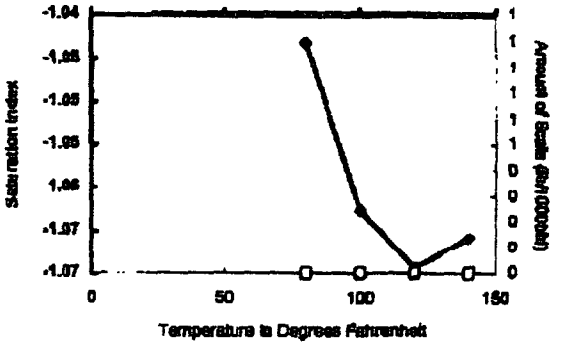
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



BAKER PETROLITE
A Baker Hughes company

Analysis: 21576

Water Analysis Report from Baker Petrolite

Summary of Mixing Waters		
Sample Number	016548	106549
Company	ARCO PERMIAN	ARCO PERMIAN
Lease	J. H. WILLIAMS	J. H. WILLIAMS
Well	WELL #2	WELL #2
Sample Location	SOUTH SEPARATOR - UPPER ZONE	NORTH SEPARATOR - LOWER ZONE
Anions (mg/L)		
Chloride	168,745	144,586
Bicarbonate	24.0	256
Carbonate	0.00	0.00
Sulfate	4,322	967
Phosphate	0.00	0.00
Borate	0.00	0.00
Silicate	0.00	0.00
Cations (mg/L)		
Sodium	104,922	81,945
Magnesium	2,321	8,968
Calcium	1,641	12,584
Strontium	20.0	30.0
Barium	0.20	0.70
Iron	471	591
Potassium	1,011	800
Aluminum	0.00	0.00
Chromium	0.00	0.00
Copper	0.00	0.00
Lead	0.00	0.00
Manganese	0.00	0.00
Nickel	0.00	0.00
Anion/Cation Ratio	*1.00*	*1.00*
TDS (mg/L)	282,877	230,729
Density (g/cm)	1.19	1.18
Sampling Date	7/10/98	7/10/98
Account Manager	RON MATTHEWS	RON MATTHEWS
Analyst	SHEILA DEARMAN	SHEILA DEARMAN
Analysis Date	7/16/98	7/16/98
pH at time of sampling	5.40	5.60
pH at time of analysis		
pH used in Calculations	5.40	5.60

BAKER PETROLITE
A Baker Hughes company

Analysis: 21576

Water Analysis Report from Baker Petrolite

Mixes at 80°F and 0 psi

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO_2	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$	
106548	106549	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
100%	0%	0.73	-2.17		-0.36		-0.29		-0.58		0.54	0.07
90%	10%	1.11	-1.51		-0.09		-0.02		-0.59		0.60	0.09
80%	20%	1.47	-1.15		0.04	132	0.11	245	-0.61		0.64	0.12
70%	30%	1.81	-0.91		0.12	340	0.18	388	-0.63		0.66	0.14
60%	40%	2.14	-0.74		0.16	424	0.21	434	-0.66		0.67	0.16
50%	50%	2.44	-0.60		0.17	428	0.23	420	-0.69		0.67	0.18
40%	60%	2.74	-0.49		0.17	361	0.22	370	-0.73		0.66	0.20
30%	70%	3.02	-0.39		0.15	300	0.20	294	-0.78		0.63	0.21
20%	80%	3.28	-0.31		0.11	195	0.15	202	-0.84		0.59	0.22
10%	90%	3.54	-0.24		0.05	73	0.09	98	-0.93		0.52	0.23
0%	100%	3.78	-0.18		-0.05		-0.02		-1.04		0.42	0.22

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: CO_2 Pressure is absolute pressure. Total Pressure is gauge pressure.

BAKER PETROLITE
A Baker Hughes company

Analysis: 21576

Mixture Predictions from Baker-Petrolite

106548 with 106549 at 80°F and 0 psi